

A Database Publication

# electron

Vol. 6 No. 8 May 1989 £1.25

# user

## Hands off!

How to protect  
your programs  
and data

### GAME

*Play Eliminator:  
Type-in fun listing*

### REVIEWS

*Mode 7 simulator, Superman,  
Barbarian II, Circus Games*

### UTILITIES

*Write your own disc formatter  
Add 26 extra function keys  
Explore recursive fractals  
Invent new party cocktails*

### FEATURES

*Designing your own 3D landscapes  
Sorting Electron data files into order*





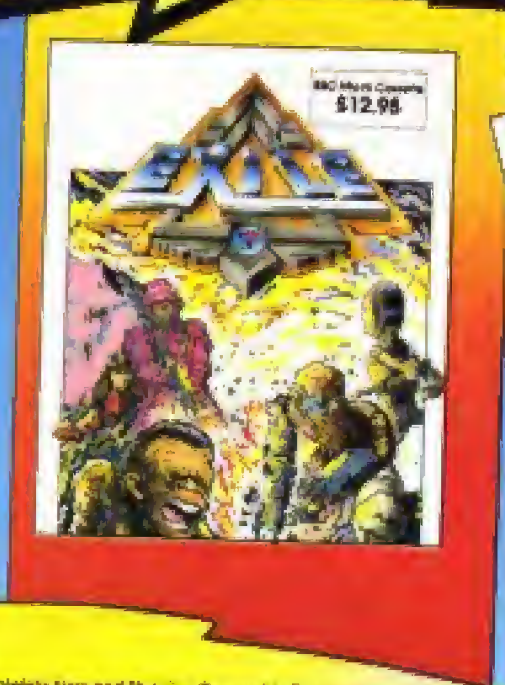
# SUPERIOR SIX



**The Last Ninja**  
The Story of the Master Arts - As the first and last of the Ninja fighting with bare hands, swords and kimonos, throwing shuriken and solving intricate puzzles.

**Play It Again Sam 7**  
A Superb New Four-Game Competition - Featuring two recent hits and two great classics: KETRAK, BOMB CRUNCHER, SWAPPER, GHOULE.

**Barbarian II**  
The Barbarian and Marius Fight the Monsters in the Dungeons of Brax - A total of 80 action-packed screens on four levels, with magical objects to collect and 20 treasure monsters to defeat.



**Exile**  
A Completely New and Stunning Concept in Computer Games - Does your enter the World of Exile? "It's definitely the best game this year. I recommend you get it soon." Acorn User.

**Repton Infinity**  
The Ultimate Repton - Four puzzling new games, with Repton behaving as never before, and a complete and highly sophisticated game designer. Win prizes for completing the games or designing new Games.

**A Question of Sport**  
The Home Computer Version of the Most Popular Sports Quiz of 1988 - With David Coleman taking the questions and Ian Ashman and Bill Beagmore heading the teams, you can pit your wits against your family, your friends or your computer.

## Great Games for Easter - Don't Miss These Top Hits!

The Last Ninja  
Play It Again Sam 7  
Barbarian II

BBC Micro Cassette.....	\$9.95	each	Acorn Electron Cassette.....	\$9.95	each
BBC Micro 5 1/4" Disc.....	\$11.95	each	BBC Master Compact 3 1/2" Disc.....	\$14.95	each

Exile  
Repton Infinity  
A Question of Sport

BBC Micro Cassette.....	\$12.95	each	Acorn Electron Cassette.....	\$12.95	each
BBC Micro 5 1/4" Disc.....	\$14.95	each	BBC Master Compact 3 1/2" Disc.....	\$19.95	each

   
24 HOUR TELEPHONE  
ANSWERING SERVICE FOR  
ORDERS

Please make  
all cheques  
payable to  
"Superior  
Software Ltd."

 **SUPERIOR  
SOFTWARE**  
Limited  
(Acornsoft is a registered trademark of Acorn Computers Ltd. Superior Software Ltd is a registered user)  
Dept 55X1, Regent House, Skinner Lane, Leeds LS7 1AX. Telephone: (0532) 469453

**ACORN SOFTWARE**

**OUR GUARANTEE**  
• All mail orders are despatched within 24 hours by first-class post.  
• Postage and packing is free.  
• Faulty cassettes and discs will be replaced immediately.  
(This does not affect your statutory right)





# CONTENTS

## Cover Story

### 44 Protection

The secrets of program protection revealed. Make your programs and data secure with these handy utilities.

### 5 News

All the latest developments in the ever thriving world of the Electron. Plus the popular Gallup software chart.

### 9 Landscape

Design your own volcanic islands and view them in 3D with this fascinating utility.

### 11 Discovery

We show how to write your own fast and flexible disc formatting utility.

### 14 Games Software



Three blockbusters are play-tested this month: Barbarian II, Circus Games and Superman.

### 17 Eliminator

Try your hand at this fast paced alien shoot-'em-up. Are your reactions fast enough?

### 21 Fractals

Explore the spectacular world of recursive fractal programming with this simple type in listing.

### 24 10 Liners

This month's mini programming marvels will have you wondering whether your eyes are playing tricks on you.

### 28 Pendragon

A helping hand for adventure enthusiasts and a quick guide to the start of Rick Hanson.

### 31 EZ Type

Add another 26 function keys to your keyboard and cut down on the typing when entering listings.

### 37 Mode 7

We test a software-based Mode 7 simulator rom and report on its capabilities.

### 39 Tournament

Sort large data files into order by writing a simple knockout contest program.

### 47 Micro Messages

The pages you write yourselves. A selection of the best letters from our bulging mailbag.

### 53 In Action

Use your Electron to invent new party cocktails with this useful program.

Published by  
Database  
Publications Ltd  
Europa House,  
Adlington Park, Adlington,  
Macclesfield SK10 4NP.

Tel: 0625 878888  
FAX: 0625 879966  
(Editorial, Admin, Advertising)  
051-357 2981 (Subscriptions)

T/Gold Mailbox: 72-MAG001  
Postel: 614566383  
Telex: 931216888 DB

ABC

22,033 Jan-June 1988

Managing Editor  
Derek Maskin

Group Editor  
Alan McLachlan

Features Editor  
Roland Waddilove

Production Editor  
Peter Glover

Reviews coordinator  
Pam Turnbull

Promotions Editor  
Christopher Payne

Advertising Sales  
John Snowden  
Peter Babbage

News trade distribution:  
Diamond Europress Sales & Distribution, Unit 1, Burgess Road, Ivyhouse Lane, Hastings, East Sussex TN35 4NR. Tel: 0424 430422.

Printed by Carlisle Web Offset

Electron User is an independent publication. Acorn Computers Ltd. are not responsible for any of the articles in this issue or for any of the opinions expressed.

Electron User welcomes program listings and articles for publication. Material should be typed or computer-printed, and preferably double-spaced. Program listings should be accompanied by cassette, tape or disc. Please enclose a stamped, self-addressed envelope, otherwise the return of material cannot be guaranteed. Contributions accepted for publication will be on an all-rights basis.

ISSN 0952-3057

© 1989 Database Publications Ltd. No material may be reproduced in whole or in part without written permission. While every care is taken, the publishers cannot be held legally responsible for any errors in articles or listings.

Database Publications is a  
division of Europress Ltd.

**Back to  
school**

10 educational  
games for the  
Electron for just £5.95



Write your own arcade smashes using the

# ARCADE GAME *Creator*

Arcade Game Creator is a suite of programs for the Electron and BBC Micros. Taken from the pages of *Electron User*, it lets you into the secrets of writing fast-action arcade games, and provides you with a number of utilities to make design and programming easier.

Among the programs are:

- A Mode 5 sprite editor that lets you design your own multi-coloured characters.
- A selection of fast print routines that will move sprites both in front or behind other objects on the screen.
- Map generators that will squeeze a Mode 5 screen into 8 bytes!
- Scrolling maps.
- Score update and printing routines.  
... and much, much more.

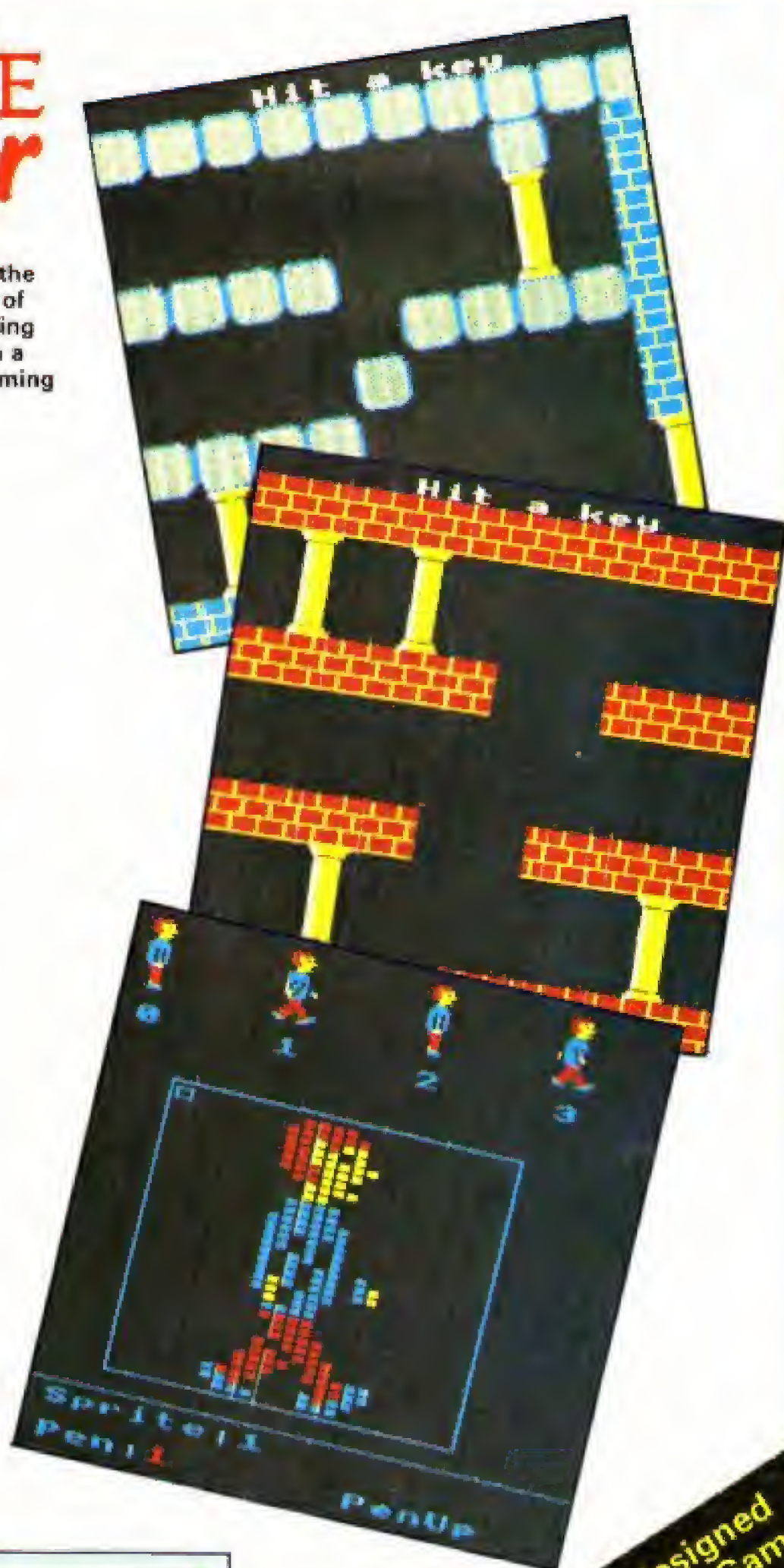
To help you make the most of the Arcade Game Creator, you will also get a comprehensive manual based on the original series.

Written in an easy to read style and with many illustrations and screen shots, it contains all the information you need to create and animate sprites, to design backgrounds and to link the two together into a complete arcade game.

If you are an aspiring games programmer, this is an offer you simply cannot afford to miss!

## Arcade Game Creator

Tape + manual .....£9.95



Screens designed  
using Arcade Game  
Creator

**TO ORDER PLEASE USE THE FORM ON PAGE 51**



## Flower folk like their Electrons

ELECTRON-based keyboards used by 2,800 Interflora florists in the UK face strong opposition this summer. Interflora has plans to replace them with PCs and will put them into 40 of their shops on a trial basis.

If the experiment works, Interflora expects to have all its members using PCs for the

flowers-by-wire services in four years time.

Before the trial *Electron User* carried out a mini survey which has resulted in a strong vote of confidence for the Electron in smaller businesses.

Most of the small florists contacted said they were quite happy with the machines they



have at present and felt they would not use the facilities offered by a PC.

Many did not even use the full potential of the Electron for such tasks as stock control.

Once the results of this summer's trial are known, they will be put to Interflora's members at their annual meeting in the autumn.

Head of the computer department at Interflora, Keith Bentley said the fact that no more Electron based keyboards were available was only part of the reason for change.

"We want to offer a system with more facilities, a comprehensive one for those of our members who want to do more than just simply transmit messages", he said.

"The present system is not perfect. We are looking to progress and take advantage of how technology has developed since we installed it five years ago".

## Champers proof keyboards

CHAMPAGNE corks popped recently at the Welsh headquarters of Kador (0443 740281) but it didn't matter if the bubbly overflowed.

Staff were celebrating the launch of the 150th version of the firm's Seal'n Type keyboard protectors. The Electron cover sells for £7.50.

## Ride 'em cowboy

TYNESOFT (091-414 4611) has jumped the Atlantic with its next offering for the Electron. After taking players inside the big top with Circus Games, the latest title has gone outdoors to let Electron fans try their hands at Rodeo Games.

Events including bronco riding, steer wrestling, calf roping, trick shooting and knife throwing.

"Rodeo Games is similar to Circus Games but takes the theme a step further", said Tynesoft's Colin Courtney. "It is set in the outdoors at a typical rodeo show".

Due out on May 19, Rodeo Games will cost £9.95 for the cassette and £14.95 on disc.

A HIGH speed parallel-serial and serial-parallel protocol converter with internal 8k and 32k buffer is now available from Worthing-based Ringdale Peripherals (0903 213131). It will drive remote parallel printer plotters over distances of up to 100m.

Priced at £98, the Ringdale high speed buffer converter supports all common baud rates and serial interface protocols from 300 to 38,400 baud and offers high data rates of up to 40,000 bytes a second.

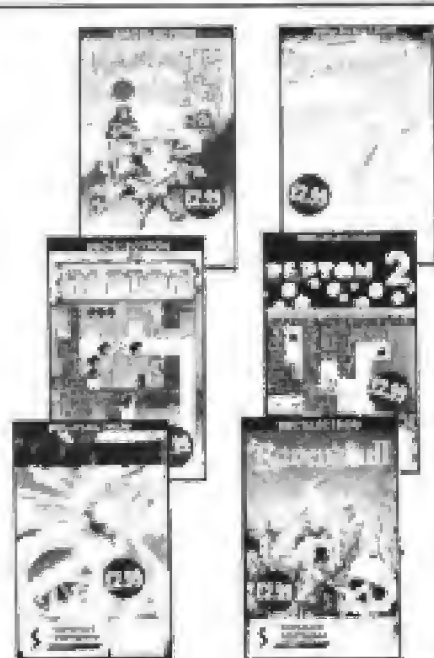
Its principal applications are as a protocol converter or a parallel line driver.

## Six on a budget

BLUE Ribbon (0302 21134) has released more Superior titles at budget prices for the Electron.

Marketing manager Mal Thomas said: "These titles sold extremely well at full price and are expected to do equally well at budget".

Now selling for £2.99 are *Galaforce*, *Ravenskull*, *Repton*, *Repton 2*, *Thrust* and *Karate Combat*.



## It's the Plus 3+

THE Advanced Plus 3 disc upgrade proved so popular among Electron users that Surrey-based Pres (0276 72046) ran out of stocks at the end of February.

It is now bringing out Advanced Plus 3, Mark 2 with a double sided disc to replace the single sided version.

Pres boss John Huddleston told *Electron User* he hoped to launch the new upgrade by the end of April, but was still formulating a price.

"The response to the Plus 3 was amazing", he said. "Depending on different formats, we sold more than 3,000. The Mark 2 will be good news for Electron users. On a single disc it will provide 640k as opposed to 320k on the previous model".

## Speedy speller

SLOGGER (0272 237496) has notched up a first with Starspell, a spell checker produced specifically for the Electron.

Designed to work with Starword or View word processing packages, Starspell is the result of popular demand and three months work by Slogger's Andrew Hildig.

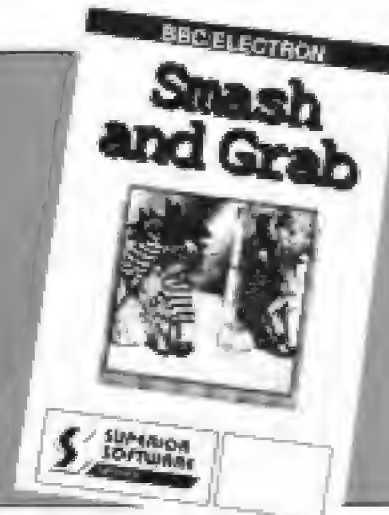
Its main claim to success is its speed - it can check a 400 word document in a few seconds.

"Electron users have been asking for a spell checker for their machines for some time", said Chris Rudge of Slogger. "They also wanted one that was compatible with Starword".

Just released, Starspell costs £29.95 with an extra £2.50 for versions to be used on machines without rom sockets. If Electron users return their View cartridge to Slogger both View and Star Spell can be put on the one cartridge for £34.95.



# Gallup Software Chart



THIS MONTH	LAST MONTH	TITLE (Software House)	COMMENTS	PRICE
1	1	<b>SMASH AND GRAB</b> <i>Blue Ribbon</i>	Making a second and successful bid for the top. Give this budget title a go if you are feeling especially villainous. Very playable.	1.99
2	4	<b>TRIPLE DECKER</b> <i>Alternative</i>	These games were originally listings in <i>Electron User</i> and <i>The Micro User</i> . There can be no argument about their value for money.	1.99
3	11	<b>RAVENSKULL</b> <i>Blue Ribbon</i>	An excellent arcade adventure which was a classic on its original label. At this price it has to be a bargain.	2.99
4	5	<b>JOE BLADE 2</b> <i>Players</i>	The graphics are good and the game very playable. The puzzle screens are difficult, and this superb sequel will keep you busy for hours.	1.99
5	7	<b>CITADEL</b> <i>Blue Ribbon</i>	A great way to start a collection of arcade games if you are new to the Electron. A classic in its own right - Citadel is superb.	2.99
6	•	<b>STAR FIGHT</b> <i>Alternative</i>	Back in the charts is this extraterrestrial shoot-'em-up. There's nothing like a bit of harmless extermination when you want to relax.	1.99
7	8	<b>STRYKER'S RUN</b> <i>Blue Ribbon</i>	An old Superior title rebadged under the Blue Ribbon label. Well worth buying this arcade-style mission and also its sequel, Codename: Droid.	2.99
8	17	<b>VIDEO CLASSICS</b> <i>Firebird</i>	A budget collection of some simple and fun games. This set keeps reappearing in the charts - cheap, cheerful and good value.	1.99
9	•	<b>THRUST</b> <i>Firebird</i>	A deceptively simple game, Thrust has been keeping people glued to their screens on many formats for years. One for the skillful manoeuvre.	1.99
10	14	<b>GRAHAM GOOCH TEST CRICKET</b> <i>Alternative</i>	Originally released by ASL, it is more suited to its budget price. Only recommended if you cannot wait for the British season to start.	1.99
11	•	<b>PLAY IT AGAIN SAM 3</b> <i>Superior</i>	One of the better Sam compilations featuring a good selection of full-priced games: Commando, Killer Gorilla, Killer Gorilla 2 and Palace of Magic.	9.95
12	15	<b>JOE BLADE</b> <i>Players</i>	The original mission for the community-conscious Joe. You don't need to buy this to enjoy Joe Blade 2, but it is worth it.	1.99
13	•	<b>REPTON 2</b> <i>Blue Ribbon</i>	Not often seen on its own since its original release. If you like completeness then this should certainly be added to your collection.	2.99
14	•	<b>WALK THE PLANK</b> <i>Mastertronic</i>	Harking back to when Mastertronic was the top budget house. Little from them for the Electron these days, so worth snapping up.	1.99
15	•	<b>KARATE COMBAT</b> <i>Blue Ribbon</i>	As with sports simulations, martial arts never die. This is a better than average implementation and good armchair exercise.	2.99
16	6	<b>COMMANDO</b> <i>Encore</i>	Excellent value and one you should add to your collection immediately. A shoot-'em-up which is everything you would expect.	2.99
17	•	<b>ROCKFALL</b> <i>Alternative</i>	You are trapped and must escape from your captivity as soon as possible. Unluckily you are not alone. Enjoyable and addictive.	1.99
18	•	<b>REPTON INFINITY</b> <i>Superior</i>	A full-priced and innovative title from Superior - not just four superb Repton-like games but also a programming language called Reptol.	12.95
19	12	<b>CHUCKIE EGG</b> <i>A&amp;F</i>	Enter the chicken house for this ladders and levels game. Fall and you'll be scrambled. Avoid disaster and collect all the riches.	9.95
20	19	<b>SNAPPER</b> <i>Acornsoft</i>	A blast from the past, though I would wait and buy it as part of Play it Again Sam 7 - you will get three other games too.	9.99



# SOFTWARE Bargains

## AMAZING OFFER!

Gyroscope  
Adventure  
Bumble Bee  
Chess (Micro Power)  
Chess (Acornsoft)  
Chess (Superior)  
Croaker  
Cybertron Mission  
Danger UXB  
Electron Invaders  
Escape from Moonbase  
Felix and The Fruit Monsters

Felix and The Evil Weevils  
Felix in The Factory  
Frenzy  
Galactic Commander  
Gauntlet  
Ghouls  
Jet Power Jack  
Killer Gorilla  
Moonrider  
Positron  
Rubble Trouble  
Stack Car

Swag  
Swoop  
The Mine  
Where?  
Business Games  
Complete Cocktail Maker  
Magic Mushrooms  
Watch your Weight  
Sphinx Adventure  
Snapper  
Hopper

Boxer  
Theatre Quiz  
Dating Game  
Science Fiction  
Death Star  
Invaders  
Repton 1  
Repton 2  
Stranded  
Tempest  
Draughts

Educational  
Desk Diary  
Graphs & Charts  
Workshop  
Talkback  
English  
Maths O Level 2  
Biology  
Linkword Spanish  
Linkword Italian  
Turtle Graphics

Or £2.50  
Each

**ANY 10 FOR ONLY £9.95!!**

Please give 2 additional choices,  
in case of non-availability

### COMPILATIONS

TITLE	F	RRP	SALE
ACORN SOFT HITS 1 (Magic Mushrooms, Maze, Planetoid, Monster)	C	9.95	4.95
ACORN SOFT HITS 2 (Starship Command, Arcadians, Snooker, Meteors)	C	9.95	4.95
MICRO POWER MAGIC 1 (Stack Car, Felix, Evil Weevils, Esc. Moonbase, Swag, Chess, Bandits at 3, Galactic Commander, Adventure, Cybertron Mission, European Knowledge)	C	7.95	5.75
PLAY IT AGAIN SAM (Clash, Thrust, Storybook Run, Ravenskull)	C	9.95	5.95
PLAY IT AGAIN SAM 2 (Repton 3, Creeper Rider, Gateforce, Codename Droid)	C	9.95	5.95
PLAY IT AGAIN SAM 3 (Commando, Palace of Magic, K. Gorilla, K. Gorilla 2)	C	9.95	5.95
PLAY IT AGAIN SAM 4 (Frak, Spalinder, Cosmic Camouflage, Guardian)	C	9.95	5.95
PLAY IT AGAIN SAM 5 (Dragon, Bug Blaster, Moonrider, Elbow)	C	9.95	5.95
PLAY IT AGAIN SAM 6 (Gateforce 2, Hunchback, Hopper, Video's Revenge)	C	9.95	5.95
PLAY IT AGAIN SAM 7 (Firetrack, Snapper, Bone Cruncher, Ghouls)	C	9.95	5.95
PLUS 3 GAMES (Planetoid, Frakbug, Maze)	D	9.95	4.95
SUPERIOR COLLECTION 3 (Synanon, Repton, Repton 2, Karate Combat, Deathstar, Mr Wiz, Smash & Grab, Overdrive)	C	9.95	5.95

### RECENT RELEASES AT SPECIAL PRICES

TITLE	RRP	OFFER
A Question of Sport	12.95	9.95
Barbarian	9.95	7.45
Bone Cruncher	9.95	7.45
By Fair Means or Foul	9.95	7.45
Circus Games	9.95	6.95
Sale	12.95	9.95
Life of Repton	6.95	5.25
Pipeline	9.95	7.45
Quint	9.95	7.45
Repton Infinity	12.95	9.95
Repton Thru Time	9.95	5.25
Spy Cat	9.95	7.45
Superman	9.95	6.95
Tank Attack	12.95	9.95
The Last Ninja	9.95	7.45
Blood of the Mudneers	12.95	9.95

### SPORT

TITLE	F	RRP	SALE
By Fair Means or Foul	C	9.95	7.45
Brian Clough's Football	C	14.95	11.95
Commonwealth Games	C	7.95	6.95
G. Gooch Test Cricket	C	9.95	7.50
Gault	C	7.95	6.95
Ian Botham Cricket	C	7.95	6.95
Indoor Sports	C	9.95	7.50
Winter Olympics '88	C	9.95	7.50
Winter Olympics	C	9.95	5.25

### JOYSTICKS

Electron Joystick (Interface)	14.95
Quickshot II Turbo (Joystick)	13.95

OFFER... BUY BOTH FOR £24.95!

Quickshot I Joystick	4.95
Quickshot II	9.95
Cheetah 125 Joystick	11.95

FOR USE WITH PLUS 1 ONLY

VOLTAIRE  
38 TWIN JOYSTICK  
RRP £21.95  
NOW ONLY  
£19.95!!



VOLTAIRE  
DELTA 38 Single joystick  
RRP £14.95... OFFER £13.95!

ELITE  
ZIPSTICK Joystick  
RRP £15.95... OFFER £10.95!

COMPETITION PRO £22.45... £19.95

### ROM CARTRIDGE OFFERS

View	14.95
Viewsheet	14.95

Buy both for £21.95 and get  
Me and My Micro book FREE!

Logo	24.95
Lisp	9.95
Turtle Graphics (Cass)	2.95

Now get all three for £19.95!

### MYSTERY GIFT

(Worth £2.95)

FREE!

With Orders over £15.00!

MINI  
OFFICE 1  
ONLY  
£4.95!

STRIP  
POKER 2  
E CASS ONLY  
£6.95!

MASTERMIND  
QUIZ GAME  
Only £6.95  
Additional  
Questions on  
QUIZMASTER  
Only £4.95  
BUY BOTH  
ONLY £9.95!!

### FUN SCHOOL 2 !!

ELECTRON CASSETTE:  
RRP £9.95 OFFER £7.95  
(Please state age-range required)

**UNDER 6's** A suite of eight programs is available for this age group. From counting Teddies, through spelling and guessing games. Children are encouraged to master the likes of numeracy, literacy and concentration.

**6-8 YEARS** For this age group, programs are devised to provide various levels of difficulty from words and numbers to coordination and logical thinking.

**OVER 8's** Older children face the challenge of an adventure game combined with a series of short puzzles. Seven of the programs are self contained but each of these has to be solved before the eighth title can be tackled.

ADVANCED USER GUIDE  
Only £1.95!

CUMANA DISC DRIVE INTERFACE  
ONLY £44.95!!

Fits into one of the ROM Cartridge slots on the Plus one interface, allowing you to attach a 5.25" or 3.5" disc drive with its own power supply unit.

ELECTRON MAINS  
ADAPTOR Only £9.95!

- Please add 95p P&P (Overseas £4.50).
- All prices include VAT
- Goods despatched within 48 hours - subject to availability
- Out of hours answerphone: 0532 436300



Dept. EU59, C/O Northwood House,  
North Street, Leeds, LS7 2AA.  
Telephone: 0532 436300



We can offer attractive discounts for all educational establishments, phone or write for a quote.

We supply a catalogue of our entire stock range per machine type with every order.



If you want to start doing more with your micro than just playing games, this package is your ideal introduction to the four most popular applications for professional computers. All the programs have been designed for simplicity, so even a child can use them. Yet they include advanced features not yet available on programs costing many times as much!

**Finalist for the Home Software  
of the Year Award**



**Contains 32 page booklet giving clear,  
easy-to-follow instructions on all 4 programs**

**Word Processor:** Ideal for writing letters and reports. There is a constant display of both time and word count, plus a words-per-minute display to encourage the budding typist! A unique feature is the double-size text option in both edit and printer mode — perfect for young children and people with poor vision.

**Database:** You use this for storing information, just like an office filing cabinet. Facts you have entered can be quickly retrieved by just keying in a word or part of a word. They can be sorted, replaced, saved for future use or printed out.

**Spreadsheet:** Enables you to use your micro for home accounts or pocket money records. It creates a display of numbers in rows and columns. Continuous updating is possible, and a changed figure can be instantly reflected throughout the rest of the spreadsheet. Your results can be saved, to be used for future updates, or can be fed into its associated program.

**Graphics:** Part of the spreadsheet section, it lets you draw bar charts, pie charts and histograms to give a graphic presentation of your statistics. Helps to give life and colour to the duller figures!

☆ Word Processor    ☆ Spreadsheet  
☆ Database        ☆ Graphics

**Now they're  
all together -  
in ONE simple  
package**

Four full-scale  
programs for  
an incredible  
low, low price! **£5.95**  
cassette

**TO ORDER PLEASE USE THE FORM ON PAGE 51**



**W**E have had many interesting graphic utilities in *Electron User*, but this one must be the most unusual yet. Landscape Designer enables you to create your own world of land and sea. An infinite variety of landscapes can be constructed and you can view them from any angle. The results resemble volcanic islands, or sometimes the rocky coast at Land's End in Cornwall.

Rolling hills, craggy peaks, deep valleys, islands, inlets and natural harbours are all possible by altering a few simple variables. The illustrations show just two of the many possibilities.

When you run the program you'll be presented with a menu. You can simply press 9

**Create your own islands and land masses with this fascinating Basic utility from the inventive David Odd**

to draw a landscape, but it is best to set the various landscape parameters first. With option two you can decide from which direction to view the landscape by setting the angle of view.

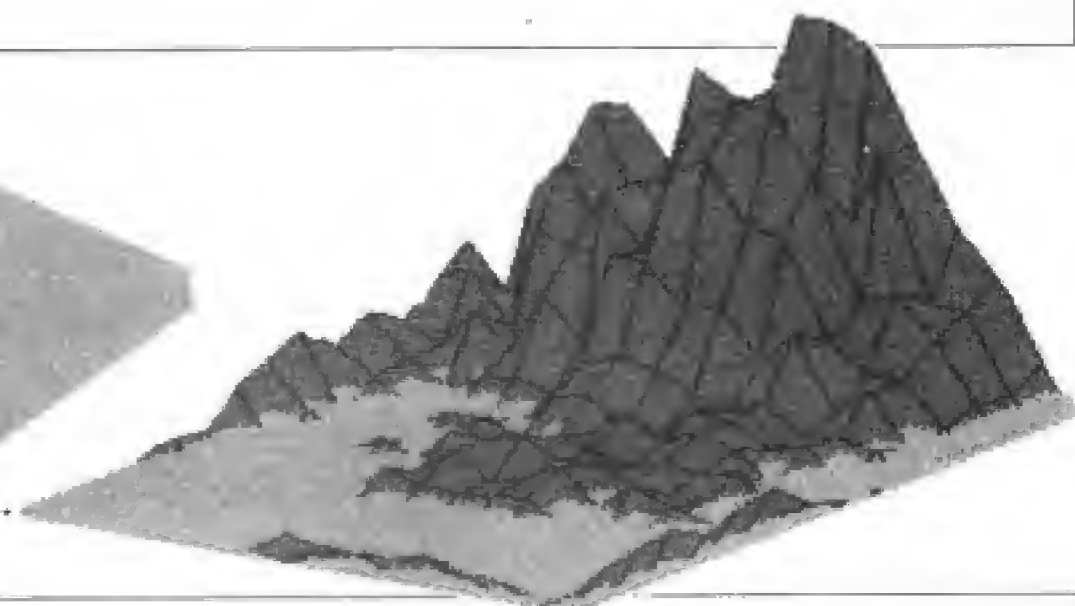
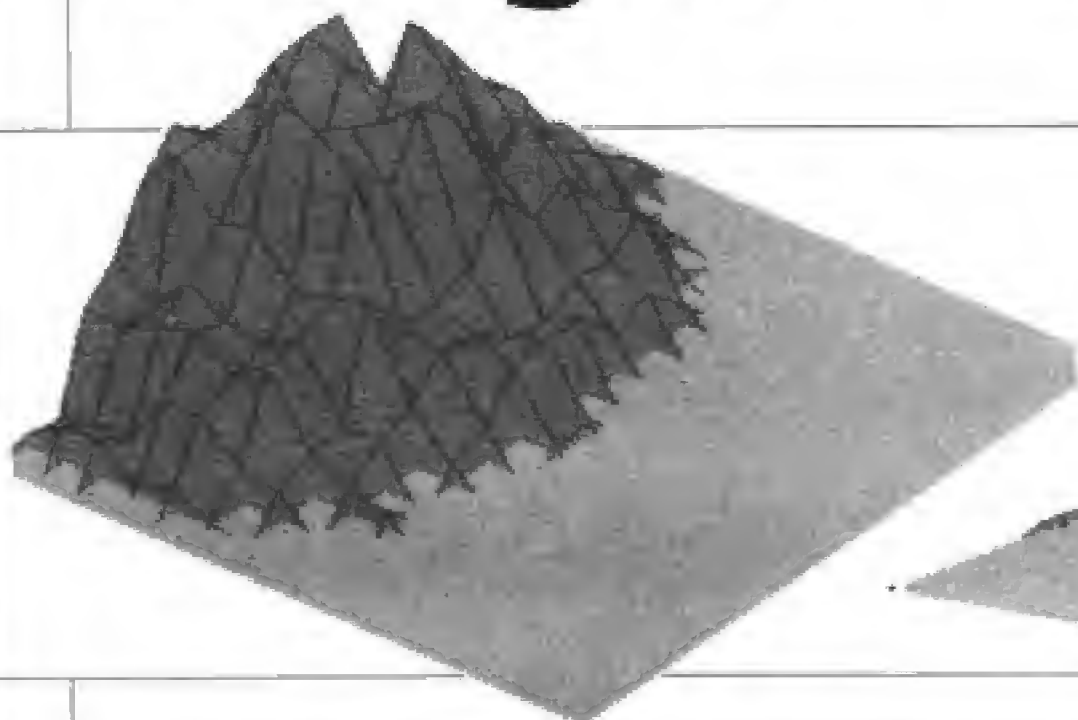
The elevation is the height from which it is viewed. With option three you can look from

a point just above sea level, or soar above it for a bird's eye view. The sea level is alterable with option four and can be used to show the effects of tides and floods.

The roughness factor, option five, decides whether you have smooth hills or rocky cliffs and mountains. As you can guess, the height – option six – sets the height of the landscape, raising hills and mountains out of the sea.

The amount of detail sets the number of plates that are used to construct the landscape. By choosing less detail in option eight the picture is drawn faster. The random numbers option seven sets a series of factors which affect the landscape in subtle ways. There isn't a way of predicting their effect.

# Designer landscapes



```
10 REM Landscape Designer
20 REM By D. Odd
30 REM (c) Electron User
40 MODE6: *FX16
50 OS="AX":PS="BX":R=RX/50
60 DIMX(16,16),Y(16,16),XZ(16,16),YZ(16,16)
70 MODE4
80 VDU28,1,30,38,1
90 VDU19,3,0,0,0,0
100 VDU19,0,3,0,0,0,0
110 PROCboarder
120 PRINT"TAB(14)"MENU"
130 PRINT"" 1. Change all statistics"
140 PRINT"" 2. Change Angle of view"
150 PRINT"" 3. Change Elevation"
160 PRINT"" 4. Change Water Level"
170 PRINT"" 5. Change Roughness"
180 PRINT"" 6. Change Height Seed"
190 PRINT"" 7. Change Random Nos."
200 PRINT"" 8. Change Amount of Detail"
210 PRINT"" 9. Print Landscape"
220 REPEAT:A=GET:UNTILA>48ANDA<58:SOUND1,-10,200,1
230 COLOUR131:COLOUR0:PRINTTAB(
```

```
2,((A-48)*2)+3);CHR$(A):TIME=0:REPEAT:UNTILTIME>75:*FX21
240 COLOUR128:COLOUR3:CLS:A=A-48
250 IF A=2 PROCang:CLS:GOTO80
260 IF A=3 PROCele:CLS:GOTO80
270 IF A=4 PROCwat:CLS:GOTO80
280 IF A=5 PROCdet:CLS:GOTO80
290 IF A=6 PROChe:CLS:GOTO80
300 IF A=7 PROCran:VDU30:GOTO80
310 IF A=8 PROCavar:CLS:GOTO80
320 IF A=9 THEN 460
330 PROCran:PROCavar
340 PROCang:PROCele:PROCwat:PROCdet:PROChe:CLS:GOTO80
350 DEFPROCran:XX=RND(360):YZ=RND(360):SZ=RND(360):CX=RND(360):OZ=RND(360):PX=RND(360):NX=RND(360):MX=RND(360):ENDPROC
360 DEFPROCele:OX=FNinput("elevation",30,5,30):ENDPROC
370 DEFPROCang:AX=FNinput("rotation (0=0,1=90,2=180,3=270)" + CHR$(13) + CHR$(10,3,0,0):IFAX=0THENDS="AX":PS="BX"
380 IFAX=3THENDS="16-BX":PS="AX"
390 IFAX=1THENDS="BX":PS="16-AX"
400 IFAX=2THENDS="16-AX":PS="16-BX"
410 ENDPROC
420 DEFPROCwat:WX=FNinput("water level",500,0,30):ENDPROC
```

```
430 DEFPROCvar:TX=FNinput("detail",2,1,2):ENDPROC
440 DEFPROCdet:RX=FNinput("roughness",100,0,50):R=RX/100:ENDPROC
450 DEFPROChe:HZ=FNinput("height seed",100,1,50):ENDPROC
460 MODE5
470 VDU23,1,0,0,0,0,0
480 PRINT TAB(5,15)"Thinking"
490 FORAX=0TO16STEPTX:FORBX=0TO16STEPTX
500 X(AX,BX)=((AX*40)+(BX*40))+10
510 Y(AX,BX)=((BX*40)-(AX*40))+((520-WX)-(300-(10*OZ)))
520 XZ(AX,BX)=X(AX,BX):YZ(AX,BX)=Y(AX,BX)
530 NEXT:NEXT
540 FORAX=0TO16STEPTX
550 FORBX=0TO16STEPTX
560 JZ=((HZ*(2-R))+((RND(HZ)*R)))
570 S1=SIN(RAD((XZ-(AX*11.25))))*(SIN(RAD(YZ-(BX*11.5))))*JZ*5:IF51<4THENS1=0
580 S2=SIN(RAD(SZ-(AX*11.25))))*(SIN(RAD(OZ-(BX*11.5))))*JZ*3:IF52<4THENS2=0
590 S3=SIN(RAD(OZ-(AX*11.25))))*(SIN(RAD(PX-(BX*11.5))))*JZ:IF53<4THENS3=0
```

Turn to Page 10 ►



#### ◀ From Page 9

```

600 S4=SIN(RAD(MX-(AX*11.25)))*
(SIN(RAD(NX-(BX*11.5)))*JX*2):IFS
4<4THENS4=0
610 I=S1+S2+S3+S4
620 OX=EVAL(OX):PX=EVAL(PX)
630 Y(OX,PX)=Y(OX,PX)+1
640 NEXT: NEXT: PROCdraw: VDU7:*FX
21
650 A=GET:GCOLD,3:MOVE100,604:O
RAW1179,604:DRAW1179,400:DRAW100,
400:DRAW100,604
660 GCOLD,0:FORAX=40196STEP8:M
OVE108,600-AX:DRAW1171,600-AX:MOV
E108,404+AX:DRAW1171,404+AX:NEXT
670 PRINTTAB(3,14)" Press 'S' t
o"
680 PRINTTAB(2,15)"*SPOOL the l
and"
690 PRINTTAB(2,16)" Any other k
ey"
700 PRINTTAB(3,17)" to return t
o"
710 PRINTTAB(3,18)" the menu"
720 AS=GETS:IFAS="5"THENPROCspo
ol
730 GOTO70
740 DEFPROCdraw
750 VDU23,1,0;0;0;0;0;GCOLD,1:PR
OCboarder:VDU19,0,6,0,0,0:VDU19,1
,4,0,0,0:VDU19,3,0,0,0,0:VDU19,2,
2,0,0,0
760 PROCwater2
770 FORAX=0TO16-TXSTEPX
780 FORBX=16-TXTO0STEP-TX
790 GCOLD,2

```

```

800 IFY(AX,BX)<YX(AX,BX)+WXORY(
AX+TX,BX)<YX(AX+TX,BX)+WXORY(AX,B
X+TX)<YX(AX,BX+TX)+WXORY(AX+TX,BX
+TX)<YX(AX+TX,BX+TX)+WXTHENPROCwa
ter1:GOTO880
810 MOVEX(AX,BX),Y(AX,BX):MOVEX
(AX+TX,BX),Y(AX+TX,BX):PLOT85,X(A
X,BX+TX),Y(AX,BX+TX):PLOT85,X(AX+
TX,BX+TX),Y(AX+TX,BX+TX)
820 GCOLD,3
830 MOVEX(AX,BX),Y(AX,BX)
840 DRAWX(AX+TX,BX),Y(AX+TX,BX)
850 DRAWX(AX+TX,BX+TX),Y(AX+TX,
BX+TX)
860 DRAWX(AX,BX+TX),Y(AX,BX+TX)
870 DRAWX(AX,BX),Y(AX,BX)
880 NEXT:NEXT:GCOLD,0:MOVEXX(16
,0),YX(16,0)+WX:MOVEXX(16,0),0:PL
OT85,XX(0,0),YX(0,0)+WX:PLOT85,0,
0
890 MOVEXX(16,0),YX(16,0)+WX:MO
VEXX(16,0),0:PLOT85,XX(16,16),YX(
16,16)+WX:PLOT85,1279,0
900 ENDPROC
910 DEFPROCwater1:GCOLD,2:MOVEX
(AX,BX),Y(AX,BX):MOVEX(AX+TX,BX),
Y(AX+TX,BX):PLOT85,X(AX,BX+TX),Y(
AX,BX+TX):PLOT85,X(AX+TX,BX+TX),Y
(AX+TX,BX+TX)
920 GCOLD,3
930 MOVEX(AX,BX),Y(AX,BX):DRAWX
(AX+TX,BX),Y(AX+TX,BX):DRAWX(AX+T
X,BX+TX),Y(AX+TX,BX+TX):DRAWX(AX,
BX+TX),Y(AX,BX+TX):DRAWX(AX,BX),Y
(AX,BX)
940 GCOLD,1:MOVEXX(AX,BX),YX(AX
,BX)+WX:MOVEXX(AX+TX,BX),YX(AX+TX

```

```

,BX)+WX:PLOT85,XX(AX,BX+TX),YX(AX
,BX+TX)+WX:PLOT85,XX(AX+TX,BX+TX)
,YX(AX+TX,BX+TX)+WX
950 ENDPROC
960 DEFPROCwater2
970 GCOLD,1:MOVEXX(0,0),YX(0,0)
+WX:MOVEXX(16,0),YX(16,0)+WX:PLOT
85,XX(0,16),YX(0,16)+WX:PLOT85,XX
(16,16),YX(16,16)+WX:ENDPROC
980 DEFPROCinput(A$,HX,LX,BX)
990 COLOUR3:PRINT" Enter the a
mount for "'";AS;" ("';LX;"-";HX
;"')";
1000 INPUTB$;
1010 IFLEN(B$)=0THEN AX=RX:GOTO1
030
1020 AX=VAL(B$)
1030 IFAZ>HXORAX<LXTHENCELOUR1:P
RINT" Number not in proper range
":SOUND1,-10,200,1:GOTO990
1040 =AX
1050 DEFPROCboarder:SZ=8
1060 VDU23,1,0;0;0;0;0;
1070 MOVED,0:DRAW1279,0:DRAW1279
,1023
1080 MOVE28,28:DRAW1251,28:DRAW1
251,995
1090 FORAZ=0TO28STEP5X:MOVEAX,AX
:DRAWAX,1023-AX:DRAW1279-AX,1023-
AX:NEXT
1100 MOVE1251,28:DRAW1279,0
1110 VDU24,32;32;1247;991;
1120 ENDPROC
1130 DEFPROCspool:CLS:VDU26:*SPO
OL Land
1140 CLS:PROCdraw:*SPOOL
1150 ENDPROC

```

## NOW OUT!

The bright new magazine that shows you how easy it is to make your own video movies...

If you have a video camera – or just thinking of getting one – you'll find *Video Action!* your passport to an exciting new world. No dull technical reviews but pages packed with help and advice – written by experts in a language *anyone* can understand.

You'll find all you need to know about lighting, scripting, directing, sound dubbing... and the magic of desktop video – using a home computer to create titles and captions and generate your own startling special effects.



It's available at your newsagents now for £1.50. If you take out a 12 month subscription on the form below you'll save £5 off the normal price. (UK only)

#### ORDER FORM

Please send me the next 12 issues of *Video Action!* for the special price £13 (normally £18)

(1530)

Payment: Please indicate method (✓)

☐ Access/Mastercard/Eurocard/Bardaycard/Visa

Expiry Date

No.

☐ Cheque/Eurocheque made payable to Database Publications Ltd.

Name

Signed

Address

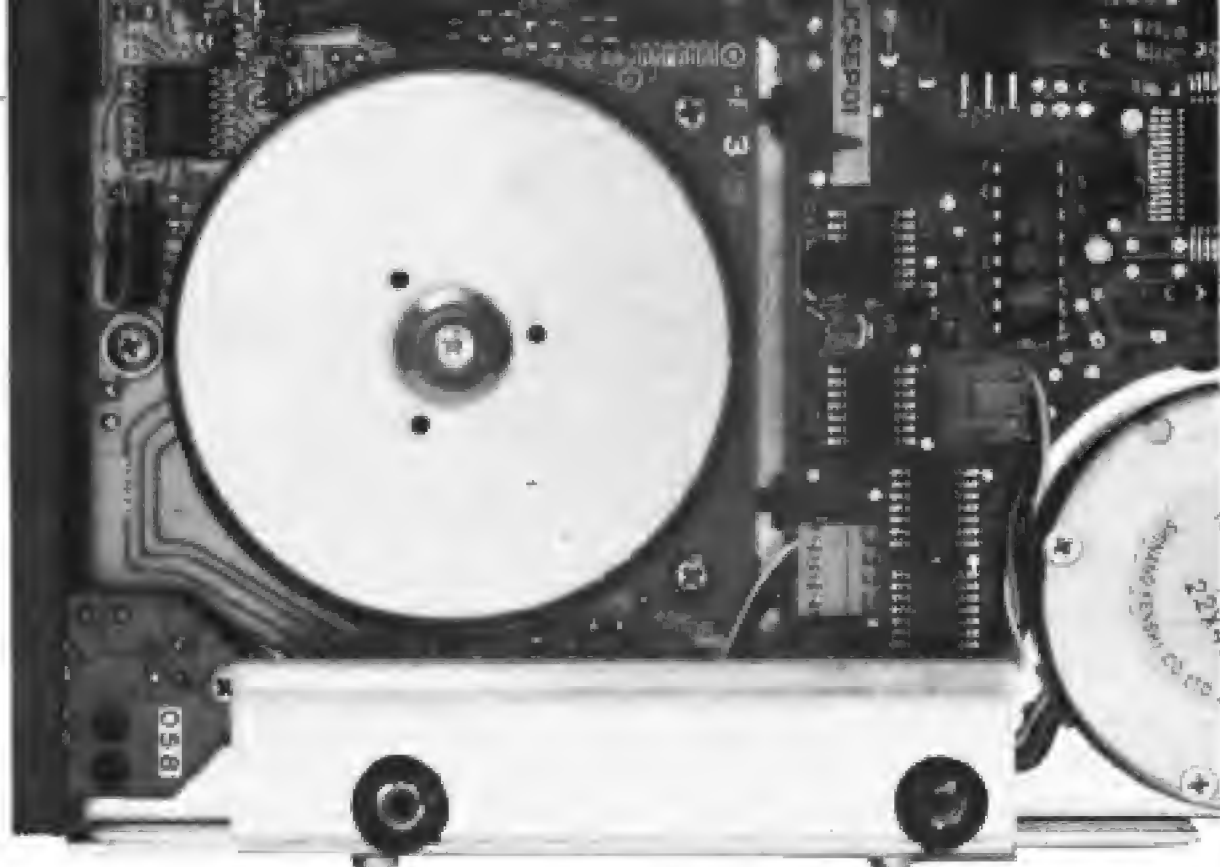
Post Code

Send to: Database Direct, Freeport Ellesmere Port, South Wirral L65 3EB. Tel: 051-357 2961

EU 5



# On the right track



**W**E have looked at a wide variety of disc operations in this series of articles exploring the Electron's DFS and ADFS disc systems. One vitally important task we have yet to examine is the process of formatting a blank floppy disc, something which must be performed on every new disc before it can be used.

The operation is surrounded by a little mystery, as the process appears to verge on the magical. It makes new discs usable and recovers corrupt ones that might otherwise be consigned to the waste paper bin.

The formatter you have used so far is probably either stored on a utilities or Welcome disc like that supplied with the Plus 3, or on rom like the DFS' built in FORM40 and FORM80 commands. All are pure 6502 machine code programs. They can, however, be just as easily written in Basic, as we shall see.

To keep things simple, and to continue our examination of osword calls that we started last month, we'll ignore the ADFS for the moment and concentrate on the DFS used in Slogger's Pegasus and the Pres Plus 4.

The ease with which we can format a

**Writing your own disc formatter is easy, as Roland Waddilove shows in Part 7 of his series on the Electron's floppy disc system**

floppy disc is due to the built-in format command of the original BBC Micro's 8271 disc controller. Although the 8271 is no longer used in the BBC Micro and has never been used in the Electron, the 1772 disc controller and DFS now incorporated in modern disc interfaces will emulate this command in order to prevent software incompatibility problems.

What this means is that effectively the WD1772 disc controller in our Electron disc interface has a built-in format command. This is implemented as an osword call. Whole tracks can be formatted in one operation and all we need to do is write a simple FOR ... NEXT loop running from 0 to 39 for 40 track disc drives or 0 to 79 for 80 track ones.

The osword &?F call to format a track -

function number &63 - requires several items of data which must be passed to it in a parameter block. The table shows the structure:

Byte	Function
0	Drive number
1-4	Address of sector table
5	Number of parameters (5)
6	Function number (&63)
7	Track number
8	Gap three (21)
9	Sector size/number (&2A)
10	Gap five (0)
11	Gap one (16)
12	Result stored here (0=OK)

The number of parameters, drive and track are all fairly straightforward and should not require explanation. Byte nine in the parameter block tells the disc controller the size

**Turn to Page 12 ►**

\*\*\*\*\* Electron User Fast Formatter \*\*\*\*\*

40 OR 80 Tracks?40

Insert disc and press Return

Track:

0  
4  
8  
12  
16  
20  
24  
28  
32  
36

1  
11  
21  
31  
41  
51  
61  
71  
81  
91

2  
10  
14  
18  
22  
26  
30  
34  
38

3  
11  
15  
19  
23  
27  
31  
35  
39

Done...

Formatting  
a 40 track  
DFS disc



#### ◀ From Page 11

of each sector and how many to squeeze into each track. DFS discs require a value of &2A which means 10 sectors per track, each 256 bytes long.

The sector table consists of a four byte entry for each sector to be created in the track. The standard DFS disc has 10 sectors per track so there must be 10 four-byte entries.

The first byte is the track number, byte three is the sector number and the last byte is the data size – a value of one specifies 256-byte sectors. Byte two is the head number and a value of zero is normally used for this. Double sided disc drives have two read/write heads – the top is numbered zero and the bottom is one.

The sector table needs updating with each track formatted, as the track number alters. The rest of the parameters are the same.

When executing the format command the disc controller first moves the read/write head to the precise position on the disc where the

track is to be created. It writes the sector identification fields using the data in the sector table and calculates and stores a cyclic redundancy checksum.

It then fills in the gaps between the sectors and identification and data fields. Finally the 256-byte data area is filled with the value &E5 and a data CRC is calculated and stored immediately following the data.

The accompanying program shows how a disc formatter can be written in Basic and how the osword call is implemented. Enter it, save it and run it to format a disc. You are prompted to input the size – either 40 or 80 track – and then off it goes, formatting the disc.

One essential task which you must not forget once you have formatted the disc is to create the directory. Fortunately this is quite simple, as apart from two bytes the whole directory covering the first two sectors on the disc is filled with zero bytes. The two non-zero ones – bytes six and seven in sector one – hold the total number of sectors on the disc.



"He's the high performance minni floppy discs chef"

### Soft sectors

Floppy discs have a very large capacity to store data. In order to make the process of writing data to the disc more easily managed the disc is divided up into tracks and each track is further divided into a number of small sectors. When you save a program it is divided up into 256-byte chunks and each chunk is saved in separate sectors.

The Electron uses a soft sectoring technique, which means that special identification marks are recorded in the magnetic film on the disc to show where each sector starts. These identifiers are put there by a program called a formatter.

A sector's identification field starts with six special sync bytes to enable the controller to synchronise with the rotational

speed of the disc. These are followed by the sector identification mark showing where the sector starts.

Following this is the track and head number. The latter indicates whether it is the top side of the disc or the bottom. Next is the sector number, followed by a code specifying the amount of data in the sector's data field. Finally in this identification field comes a two-byte cyclic redundancy checksum (CRC).

There is a gap between the identification field and the data field holding the data. Sync bytes precede the data mark which shows where the 256 bytes of data are held. There is a CRC for the data section.

Another gap filled with special bytes separates one sector from the next within each track. Two final gaps fill the rest of the track starting from the last sector and running to the end.

```

10 REM DFS Formatter
20 REM By R.A.Waddilove
30 REM (c) Electron User
40
50 MODE 4
60 COLOUR 0:COLOUR 129
70 PRINT TAB(0,2)***** Electr
on User Fast Formatter *****
80 COLOUR 1:COLOUR 128
90 PRINT
100 REPEAT
110 INPUT "40 OR 80 Tracks";TX
120 UNTIL TX=40 OR TX=80
130 PRINT
140 INPUT "Insert disc and pres
s Return"&S
150 PRINT
160 PRINT "Track:"
170
180 DIM block 16
190 DIM sectab 40
200 DIM dir 512
210
220 FOR track=0 TO TX-1
230 PRINT track;
240
250 REM Set up parameter block
260 ?block=0 : REM Drive
270 block!1=sectab : REM sector
table
280 block!5=5 : REM No. paramet
ers
290 block!6=&63 : REM Command n
umber
300 block!7=track
310 block!8=21 : REM Gap 3
320 block!9=&2A : REM 10 256-by
te sectors
330 block!10=0 : REM Gap 5
340 block!11=16 : REM Gap 1
350 block!12=0 : REM result
360
370 REM Set up sector table
380 FOR s=0 TO 9*4 STEP 4
390 sectab?s=track
400 sectab?(s+1)=0 : REM head
410 sectab?(s+2)=s DIV 4 : REM
sector
420 sectab?(s+3)=1 : REM 256-by
te sector
430 NEXT
440
450 REM call osword &7F
460 AX=&7F
470 XZ=block MOD 256
480 YZ=block DIV 256
490 CALL &FFF1
500
510 NEXT
520
530 REM Create directory in ram
540 FOR i=0 TO 511
550 dir?i=0
560 NEXT
570 dir?&106=track*10 DIV 256 :
REM No. sectors hi byte
580 dir?&107=track*10 MOD 256:
REM No. sectors lo byte
590
600 REM write directory
610 ?block=0 : REM Drive
620 block!1=dir : REM data addr
ess
630 block!5=3 : REM No. paramet
ers
640 block!6=&4B : REM command
650 block!7=0 : REM Track
660 block!8=0 : REM Sector
670 block!9=&822 : REM 2 256-byt
e sectors
680 AX=&7F
690 XZ=block MOD 256
700 YZ=block DIV 256
710 CALL &FFF1
720 PRINT

```



# Learning has never been such fun!

DATABASE  
EDUCATIONAL  
SOFTWARE

## fun school

# 2

A computer is an ideal teaching tool for young children – if you have the right software.

Fun School 2 is available for three age groups: Under-6s, 6-8 years and Over-8s. Each pack consists of eight colourful and exciting programs carefully designed by a team of educationalists.

The computer itself monitors the child's progress. The skill level – initially set by parents – is automatically adjusted to suit the child's ability.

Now children can enjoy using their parents' computer while they learn at their own pace.

*You can give your children an unfair advantage with Fun School 2 – it's the ideal way to introduce youngsters to the joys of using computers.*

Detailed instructions are supplied with each pack giving educational help to parents and teachers, together with full instructions for each program.

**A colourful  
button badge  
with each  
package!**



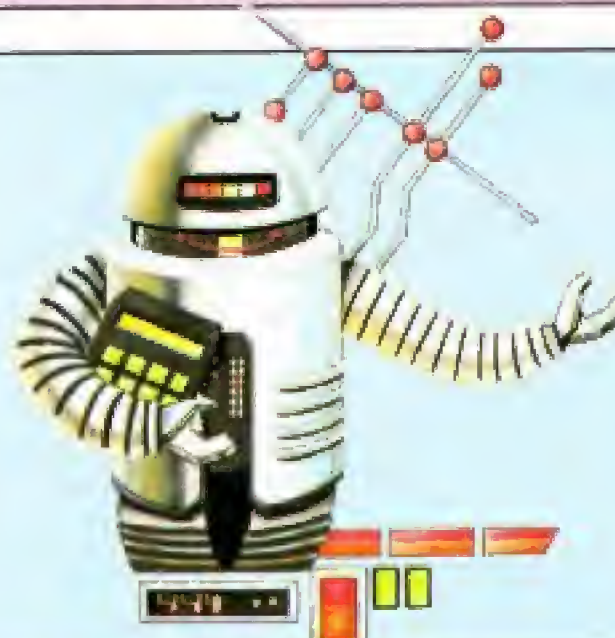
### Fun School 2 for 6 to 8 year olds contains:

- **Number train:** Calculations made enjoyable
- **Shopping:** Which shops for which products?
- **Maths Maze:** Fun improving arithmetical skills
- **Treasure Hunt:** Introduction to coordinates
- **Bounce:** Get to grips with angles
- **Packing:** Discover tessellating shapes
- **Caterpillar:** Word building challenge
- **Number jump:** Have fun practising tables



### Fun School 2 for Under-6s contains:

- **Shape Snap:** Colourful shape recognition
- **Find the Mole:** Experiment with number sizes
- **Teddy Count:** Ideal introduction to numbers
- **Write a Letter:** Creative fun at the keyboard
- **Colour Train:** Play at spotting colours
- **Pick a Letter:** Word building made easy
- **Spell a Word:** Enjoy naming the pictures
- **Teddy Bears Picnic:** Move around a maze



### Fun School 2 for Over-8s contains:

- **Build a Bridge:** Shape-fitting challenge
- **Passage of Guardians:** Enjoy anagrams
- **Unicorn:** First steps in problem solving
- **Logic Doors:** Mapping made easy
- **Souvenirs:** An introduction to travel
- **Code Boxes:** Discover binary arithmetic
- **Mystery machine:** Have fun breaking codes
- **Escape:** A final check on progress

**TO ORDER, PLEASE USE THE FORM ON PAGE 51**



**Product:** Circus Games  
**Price:** £9.95 (tape) £14.95 (disc)  
**Supplier:** Tynesoft, Addison Industrial Estate,  
 Blaydon, Tyne & Wear NE21 4TE.  
 Tel: 091-414 4511



## Big top

**D**ONNING sequined tights and a lurex leotard, I step flamboyantly into the circus ring. Stefan Brookolini, master of the high wire and tamer of big stripy pussy cats, is ready to take part in the circus spectacular of the year, Circus Games, courtesy of Tynesoft.

Up to four players can compete in the big top tournament – a four event extravaganza that includes tiger training, tightrope walking, trapeze and trick horse riding. I suggest you take advantage of the practice option – at least there will be no audience to laugh as you plummet to your three deaths.

The tiger training event was quite puzzling – according to the instructions the ring should have contained an obstacle course over which the tiger was to be guided, a tiger-head cursor, a tiger and me. All of the aforementioned items were present except for one – me. I was nowhere to be seen.

I hope my absence was not due to cowardice on my sprite's part. Although this is an interesting game section, the big cat's colours were very poor indeed and he looked like a mottled tabby rather than a striped tiger. That apart it's great fun.

Old timers who remember Superior Software's Hunchback will have a distinct advantage when playing event number two,



Tightrope walking

the trapeze. You stand there high above the ring and as the rope swings towards you you jump and grab hold. By moving your legs at the correct time you can increase the height of your swing – one of the most critical factors affecting your success. Swing too high and you will soar into the lights, too low and you will plummet like a falling trapeze artist. As if swinging wasn't enough to cope with,

you must time your release so that the far trapeze is within your reach as you complete your graceful arc across the ring. And if you intend scoring any points at this event you had better perform an assortment of twists and somersaults to impress the judges.

The tightrope event employs a dual view display as the walker is seen both from the side and above. The top view allows you to

## Brutal cut-'em-up

**Product:** Barbarian II  
**Price:** £9.95  
**Supplier:** Superior Software, Regent House,  
 Skinner Lane, Leeds LS7 1AX.  
 Tel: 0532 459453



THE original Barbarian from Superior Software/Palace was a smash hit in 1988 with its exciting hand-to-hand combat, superb graphics and grunts, groans and clanging of sword against sword. Two features made it stand out from the crowd – the scantily clad Maria Whittaker on the box and adverts (though nothing was said of the equally scantily clad male), and the graphic depiction of the unfortunate warriors being decapitated. In the

sequel, Barbarian II: The Dungeon of Drax, both features are retained.

Load up the game and you'll be presented with a picture of a dungeon with two warriors standing either side of a burning brazier. This screen heralds the first of the changes from the original game – you can choose to be either the barbarian of the title or the Princess Mariana. I tried both, but couldn't distinguish any difference in combat ability.

After choosing your warrior the rest of the game is loaded. The action takes place in the bottom half of the screen while a large Barbarian II banner lies just above the play area and an information strip is at the very bottom. In this a sword on top of a shield always points north and a scroll shows the current level plus your score.

Each of the first three levels consists of around 28 screens and you can walk left or



## extravaganza



Trick horseback riding

see when you are beginning to overbalance to the left or right, a state of affairs which can be corrected using the appropriate keys.

A remarkable degree of realism has been programmed into this event. Just as in the real discipline, there is a tendency for the inexperienced walker to make a dash for the far podium – this invariably finishes with the artiste providing an involuntary demonstra-

tion of Newton's laws of gravity.

The final event is the easiest of the four. Sitting and standing on a galloping white charger you have to perform a series of somersaults and handstands. Once again the left and right keys are used to maintain your balance while the fire key initiates any of the four breathtaking stunts. All events are realistically animated and respond well to the

controls, but the sound is limited to a few beeps.

Circus Games is a new and interesting variation on the decathlon type of program that has proved so successful over the years. I see no reason why this game should be any different.

Steve Brook

Sound	4
Graphics	10
Playability	9
Value for money	9
Overall	9

### Second Opinion

Circus Games is another blockbuster of a package from Tynesoft. If you've got a disc drive then the disc version is an absolute must as loading time is cut to seconds. You can practise events and chop and change as much as you like.

The graphics are excellent, and though the attempt at digitised sound at the start is interesting, it doesn't quite work. Overall it's a superb compilation of unusual and interesting games.

Roland Waddilove

right or through a cave to the next location. There's no scrolling, and each new screen flicks up fairly rapidly. The first level is the wastelands, the second the caverns and the third the dungeon.

The object is to make your way to a certain location on one of the 28 or so screens. Your first problem is to hack and slash your way through the monsters which inhabit each screen. These include dinosaurs, furry two legged beasts, cavemen, chickens and other creatures which defy description.

Apart from the monsters, the other main obstacle is the way the screens are mapped. For instance, if you walk left off one screen you can either appear on the right of the next or at the mouth of a cave also on the right. In the heat of the battle it's very easy to become confused about which way you are facing. The sword-compass always shows which direction is north.

There are objects to collect which will help you in your mission to destroy Drax. An axe increases your strength, a globe guards against Drax's magic, a potion increases your strength, a shield guards against the demon's fiery breath and so on.

The number of fighting moves has been reduced to four and I found that just one or



two were required to kill the opponents. The hard part is finding the right location to take you to the next level and the fighting aspect takes up a smaller proportion of the action.

The graphics and animation are excellent, and the gory decapitation scene is still here. The sound effects add to the atmosphere and the whole game is professionally produced.

Barbarian II is an excellent sequel to the original hack and slash cut-'em-up combat game as this version has more depth, better graphics and improved sound. If you liked Barbarian you'll like this too.

Roland Waddilove

Sound	5
Graphics	9
Playability	9
Value for money	9
Overall	9

### Second Opinion

I was disappointed by Barbarian II's lack of fighting manoeuvres – it's what made the original so good. However, I welcome the new exploring and mapping aspect, plus the collectable objects, and these features add more depth of gameplay.

If you're on the lookout for a new combat challenge Barbarian II fits the bill quite nicely.

Janice Murray



# Up, up and away!

Is it a bird? Is it a plane? No, it's Superman, the Man of Steel. Tynesoft now brings that hero of the comic book on to your Electron. The software comes on what looks like a C90 cassette – it's a massive program. This is a multi-part game like many of Tynesoft's latest packages, but unlike some, each section must be completed before you are allowed to progress to the next.

The story so far: Mysterious earthquakes and volcanoes threaten to devastate the Earth. Lois Lane and the Governor have been taken aboard a hi-jacked yacht by terrorists and what's more, two of Superman's most dangerous enemies are against him.

The playing screen is divided into two areas. On the left is a control panel showing the currently active super power, your strength, score and so on. The right hand side contains the window where all the action takes place.

Adopting the role of Superman, you first have to meet Professor Corwan at Star Laboratories, but on the way you encounter the Parademons. In this first stage you must kill the demons with your laser eyes or by thumping the living daylight out of them with your superhuman strength. A quick blast of super breath helps keep them at bay while you gather strength.

Select Superman's mode of assault by pressing the Shift key. Icons on the left of the screen will display what mode you are in. As soon as you kill a couple of Parademons more are born through the Boom Tube which drifts down from the sky just when you think you have wiped them out.

Some of the demons ride concussion cannon firing concussion clouds as they ap-

Product: *Superman*  
Price: £9.95 (cassette)  
Supplier: Tynesoft, Addison Industrial Estate,  
Blaydon, Tyne & Wear.  
Telephone: 091-414 4611

proach. Come into contact with one and your energy level quickly falls. If you manage to polish off enough demons within the time limit another scene will load. You must now immediately go to the SS Atlantis, the yacht where Lois and the governor are being held hostage.

Using your super-strength kick, breath, punch and fight your way along the deck of the Atlantis dispatching any terrorists on the way. Free the governor and fly off with Lois to Star Laboratories. If only it was this easy – the bad news is that the terrorists are equipped with laser cannon and seem to have the strength of 10 men, so venture cautiously.

On arriving at Star the professor tells you that he must go to the laboratory in a space shuttle to gather important data concerning the seismic activity of the planet. You have to guide the shuttle through an asteroid storm riddled with Kryptonite. Again using your super-powers, punch the asteroids and zap the kryptonite with your laser vision.

After hours of practice this third stage is the furthest I have reached. The goal is to battle through five more stages and reach

the end where you must destroy the geo-disruptor situated in the core of the Lexcorp Satellite station.

The game, although very playable, is by no means easy and the first stage may leave you somewhat frustrated after a while. Once you have got though it and on to the next level you'll be curious as to what lies ahead on future levels, making you all the more determined.

There is one annoying fault with this otherwise excellent game. When you die you have to rewind the tape almost back to the beginning and reload virtually the whole lot. Apart from that Superman is super.

David McLachlan

Sound .....	6
Graphics .....	9
Playability .....	8
Value for money .....	9
Overall .....	8

## Second Opinion

Superman could have made Golden Game this month, but for two things – it's difficult and you have to reload every time you get killed.

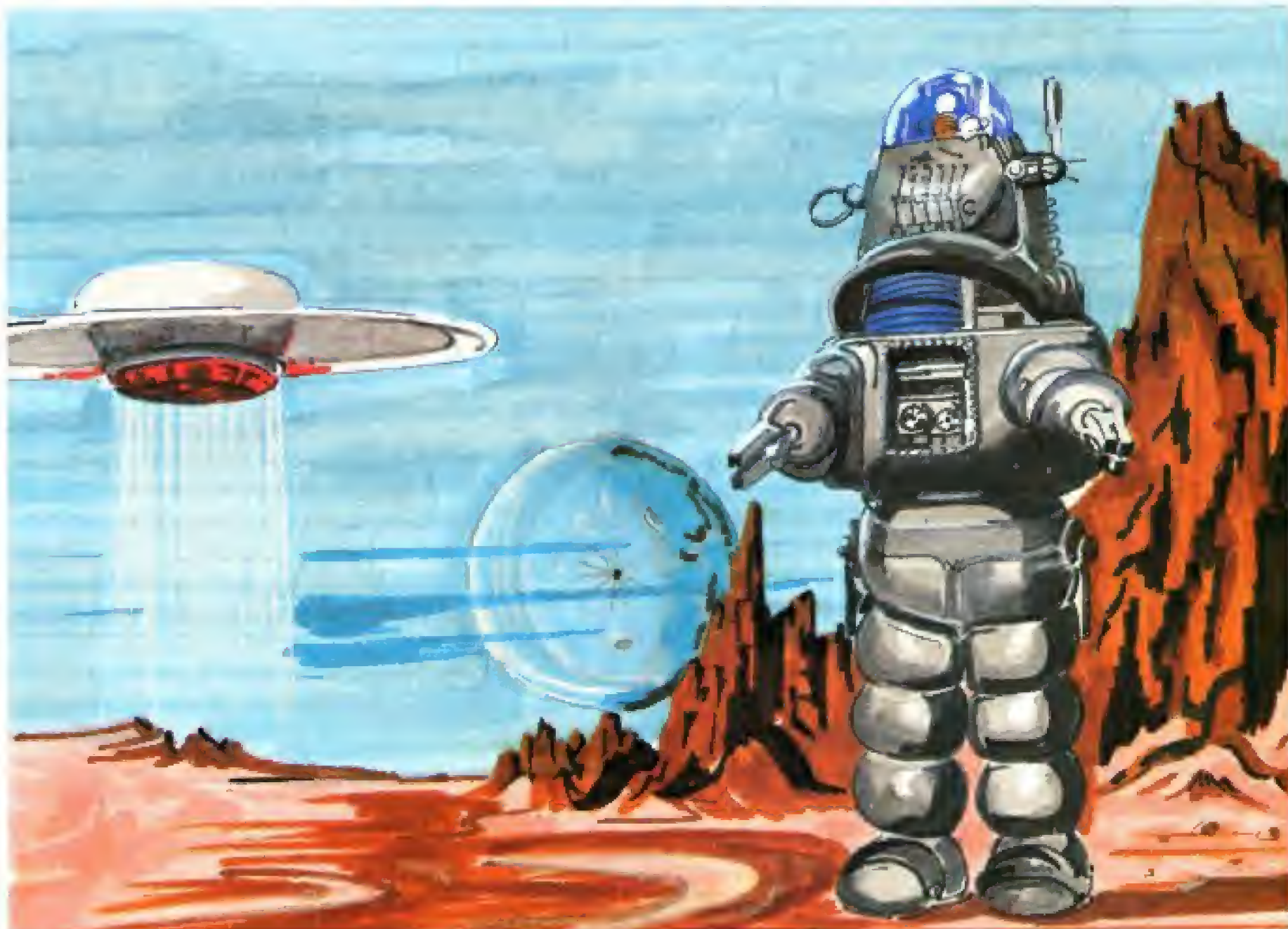
The graphics are superb and the game-play is exciting and addictive. The sound is minimal, but this wasn't really noticeable. It's a pity you can't practice any section you want as this would have made the game far more enjoyable.

Roland Waddilove





# Alien invasion



**T**HE Earth is under threat of alien invasion once again, and as ever, it's up to you to beat off an attack by Krellian bug-eyed monsters. Alien spaceships appear out of hyper space and line up in attack formation above the planet's surface. One by one they swoop down, guns ablaze. You control an advanced laser base blessed with an unlimited supply of rapid-fire missiles and your task is to completely wipe out the alien threat.

The keys Z and X move your base left and right while pressing Return fires a missile.

**Defend or die in this fast action arcade game devised by Anthony Houghton**

Several can be fired in rapid succession by constantly tapping Return, and the best tactic is to move left and right spraying missiles

non-stop at the alien attack formation above. If you manage to wipe out the first wave a new one will appear and more ships will swoop down the screen on bombing runs. Keep clear of these if you can.

The game features a high score table set against a scrolling star background to record the top 10 players. A large proportion of the listing is assembly language so enter it with care. The machine code is used to speed up the action and implement fast moving multi-coloured sprites.

```
10 REM Eliminator
20 REM by A.Houghton
30 REM (c) Electron User
40 IF PAGE>8000 GOTO 1300
50 ONERRORIFERR=17GOTO80ELSEMO
DE6:REPORT:PRINT" at line ";ERL:EN
D
60 ENVELOPE1,1,-5,-3,-1,100,10
0,100,126,0,0,-126,126,126:ENVELO
PE2,1,12,-12,6,1,10,10,126,0,0,-1
26,126,126
70 MOVE5:PROCassem:flag%=0
80 !score=0:sheet=1:?diff=210:
?lives=5:PROctitle
90 PROCiniv
100 PROCscreen:CALLmain:IF?shot
=26PROCbonus ELSEPROCKILL
110 IF?shot=26GOTO90ELSEIF?live
```

```
s>0GOTO100
120 VDU28,4,18,15,16,12,17,3:PR
INT" GAME OVER":VDU26:IFscore?1
>hiscor?15OR(score?1=hiscor?15AND
?score>hiscor?14)PROCshuffl:flag
%=TRUE
130 PROCwait(200):GOTO80
140 DEFPROCKILL:SOUND0,-15,4,8:
SOUND0,-10,5,8:SOUND0,-5,6,8:XX=?
shpx:YX=27:CALLcalc:FORNX=1TO64:I
os=!ed:!ed=&5000:XX=3:YX=24:*FX19
150 CALLprint:VDU19,0,NIMOD2;D;
:NEXT:?lives=?lives-1:PROCwait(10
0):ENDPROC
160 DEFPROCwait(t):TIME=0:REPEA
TUNTILTIME>t:ENDPROC
170 DEFPROCbonus:VDU28,0,19,19,
15,12,17,3:PRINT" All aliens dest
```

```
royed" TAB(5)"BONUS:":VDU26:shee
t=sheet+1:PROCdiff
180 bonX=400*sheet:PROCdbon:PRO
Cwait(50):REPEAT:SOUND&10,0,0,0:b
onX=bonX-40:CALLinse:CALLinse:SOU
ND0,-15,4,1:PROCdbon:CALLpsc:UNT1
LbonX=0:PROCwait(100):ENDPROC
190 DEFPROCdbon:COLOUR1:PRINTTA
B(11,18)RIGHT$("0000"+STR$bonX,5)
:ENDPROC
200 DEFPROCdiff:IF?diff>120 ?di
ff=?diff-30:ENDPROC
210 IF?diff>60 ?diff=?diff-20:EN
DPROC
220 IF?diff>30 ?diff=?diff-15:EN
```

Turn to Page 19 ▶



## New Educational Bundle

For a limited period we are offering ALL THREE Fun School 1 tapes AND Nursery Rhymes in a special educational bundle for just £9.95 – saving you well over £10!

# FUN SCHOOL!

### Ages 2-5

Alphabet  
Colours  
Counting  
House  
Magic Garden  
Matchmaker  
Numbers  
Pelican  
Seaside  
Snap



**PELICAN**  
*Teach your children to cross the road safely at a Pelican crossing*

### Ages 5-8

Balance  
Castle  
Derrick  
Fred's Words  
Hilo  
Maths Test  
Mouser  
Number Signs  
Seawall  
Super Spell



**NUMBER SIGNS**  
*Provide the correct arithmetic sign and aim to score ten out of ten*

- Use your Electron to teach and amuse your children at the same time.
- Three packages crammed full of educational programs – and so easy to use!
- Each program has been educationally approved after extensive testing in the classroom.

RRP £20.80

OUR PRICE  
**£9.95**

### Ages 8-12

Anagram  
Codebreaker  
Dog Duck Corn  
Guessing  
Hangman  
Maths Hike  
Nim  
Odd Man Out  
Pelmanism  
Towers of Hanoi



**HANGMAN**  
*Improve your child's spelling with this fun version of the popular game*

## NURSERY RHYMES

# 5

fun-packed educational programs . . . for young children everywhere

This delightful collection of programs is based around children's favourite Nursery Rhymes. There's plenty of sparkling colour, sound and captivating animation to keep them riveted – and as they play they'll be learning all the way.

- ★ Tell the time with Hickory Dickory Dock.
- ★ Assemble the jigsaw in Humpty Dumpty.
- ★ Learn to spell with Jack and Jill.
- ★ Match the animals in See Saw Marjory Daw.
- ★ Play an exciting game in Hey Diddle Diddle.



**TO ORDER PLEASE USE THE FORM ON PAGE 51**



```

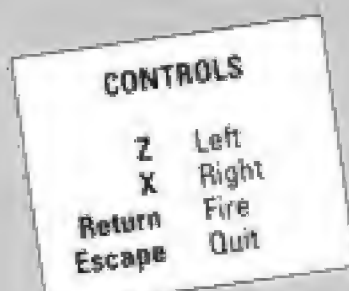
NDPROC
230 IFDdiff>10 ?diff=7diff-10
240 ENDPROC
250 DEFPROCstars:FORX=0TO39:YX
=RND(30)-1:CALLcalc:stl?XZ=7ad:st
h?XZ=ad?1:stf?XZ=RND(7)
260 att?XZ=(RND(2)-1)*2+(RND(2)
-1)*32:?(!ad AND&FFFF)+stf?XZ)=s
tt?XZOR?(!ad AND&FFFF)+stf?XZ):
NEXT:ENDPROC
270 DEFPROCinva:NZ=0:FORX=2TO8
STEP6:FORX=1TO37STEP6:PROCinv:NE
XT,:FORX=5TO11STEP6:FORX=4TO34S
TEP6:PROCinv:NEXT,:ENDPROC
280 DEFPROCinv:IFNX?flagt=0NZ=N
X+1:ENDPROC ELSENZ?origxt=xX:NX?o
rigyt=yX:NX?curxt=xX:NX?curyt=yX:
NX?flagt=80:NX=NX+1
290 XX=xX:YX=yX:CALLcalc:ios=im
d:iod=85058:XX=2:YX=16:CALLprint:
ENDPROC
300 DEFPROCininv:FORX=0TO25:NX
?flagt=80:NEXT:shot=0:ENDPROC
310 DEFPROCscreen:CLS:PROCstars:
PROCinva:shpx=20:ios=850007CE0:
XX=3:YX=24:CALLprint
320 COLOUR1:PRINTTAB(0,0)"SCORE
LVL LVS HI":CALLpac:CALLpliv:PR
INTTAB(7,1):sheet:VDU31,14,1:PROC
dhisc(hiscor)
330 FORX=0TO3:NX?bulx=-1:NEXT:
FORX=0TO19:NX?bomy=30:NEXT:ENDPR
OC
340 DEFPROCsscm:DIMX2000:REST
ORE1280:FORX=85000TO85077STEP4:R
EADAB:INX=EVAL("B"+AS):NEXT
350 table=0X:FORX=0TO30:tablef
(NX*2)=NX*E140+85A80:NEXT:IFINKEY
-256=timer=829F ELSEtimer=82AD
360 DIMstl 40,sth 40,atf 40,att
40:tmpe=880:lo=881:hi=882:seed=8
83:atc=884:?seed=RND(256):bulx=88
5
370 DIMorigxt 26,origyt 26,curx
t 26,curyt 26,flagt 26,dirxt 26,d
iryt 26:origx=860:origy=861:curx=
862:cury=863:flag=864:dirx=865:di
ry=866
380 diff=867:invpt=868:shot=890
:del=86A:DIMbomx 20,bomy 20
390 os=870:od=872:ns=874:nd=876
:ad=878:tx=87A:ty=87B:shpx=87C:de
ad=87D:y=87E:FORP=0TO2STEP2:PX=ta
ble+64:COPTP
400 .bulx EQU&FFFFFFFFF:.bulx E
QU&FFFFFFFFF
410 .aprite STXtx:STYty:JSRprin
t:LDAns:STAos:LDAns+1:STAos+1:LDAn
d:STAod:LDAnd+1:STAod+1:LDXtx:LD
Yty
420 .print STYy:.prl1 LDYy:.prl
2 DEY:LDAd(od),Y:EOR(os),Y:STA(os)
,Y:CPY&0:BNEprl2
430 LDAd:CLC:ADCy:STAod:LDAd+
1:ADC&0:STAod+1:LDAns:CLC:ADC&40
:STAos:LDAns+1:ADC&1:STAos+1:DEX:
BNEprl1:RTS
440 .calc LD&0:STAod+1:TXA:LDX
&3:.rolp ASLA:ROLad+1:DEX:BNErolp
:STAod:TYA:ASLA:TAY:LDatable,Y:CL
C:ADC&0:STAod:LDatable+1,Y:ADC&+
1:STAod+1:RTS
450 .main LD&253:STATimer:STAd
ef1:LD&0:STAddead
460 .mainlp LD&281:LDY&0:LDX&0
:JSR&FFF4:TYA:BNEntf1:CPX&13:BNEnt
f1:JSRfire
470 .ntf1 LD&21:LDX&0:JSR&FFF4
480 LDXshpx:LDY&27:JSRcalc:LDAd
d:STAos:LDAd+1:STAos+1:LD&881:L
DX&89E:LDY&8FF:JSR&FFF4:TYA:BEQnt
le:LDAshpx:BERntle:DECshpx
490 .ntle LD&881:LDX&280:LDY&8
FF:JSR&FFF4:TYA:BERntri:LDAshpx:C
MP&37:BERntri:INCshpx
500 .ntri LDXshpx:LDY&27:JSRcal
c:LDAd:STAns:LDAd+1:STAns+1:LD&
&0:STAod:STAnd:LD&850:STAod+1:ST
And+1:LDX&3:LDY&24:JSRsprite
510 JSRmbula:JSRwait
520 .invaders LD&25:STAlnvpt:

```

```

invlp JSRrandom:AND&7:BNEdif1:INC
def1:.dif1 LDYinvpt
530 LDAorigxt,Y:STAorigx:LD&ori
gyt,Y:STAorigy:LD&acurxt,Y:ST&acurx
:LD&acuryt,Y:ST&acury:LD&adirxt,Y:ST
&adiry:LD&adiry,Y:ST&adiry:LD&adiry
,Y:ST&adiry
540 .mvinv BITflag:BMIinvmv:JMP
nxtinv
550 .invmv BVSctrdiv:LD&def1:CM
Pd1ff:BC&mkdiv:JMPnxtinv
560 .mkdiv LD&0:ST&def1:LD&8&C
0:ST&flag:JSRrandom:AND&1:ST&dirx
:LD&1:ST&diry:LD&origx:ST&acurx:L
D&origy:ST&acury
570 .ctrdiv LD&curx:LD&cury:JSR
calc:LD&ad:STAos:LD&ad+1:STAos+1:
LD&858:STAod:LD&850:STAod+1
580 JSRrandom:AND&31:BNEdcix:LD
&dirx:EOR&1:ST&dirx:JMPdcif:.dcif
JSRrandom:AND&31:BNEdcif:LD&diry
:EOR&1:ST&diry

```



```

590 .dcif LD&acurx:SEC:SB&origx:
CLC:ADC&3:CMPI&7:BC&nsay:LD&acury:S
EC:SB&origy:CLC:ADC&3:CMPI&7:BC&ns
ay
600 LD&flag:CMPI&C1:BNE&nsay:LD&
origx:ST&acurx:LD&origy:ST&acury:LD
&880:ST&flag:JMPprinv
610 .nsay LD&dirx:BNEint1:LD&acu
rx:BERint12:DEC&curx:JMPintr:.int1
2 LD&1:ST&dirx:INC&curx:JMPintr:.
intr2 LD&0:ST&dirx:DEC&curx:JMPin
tr:.int1 LD&acurx:CMPI&38:BERintr2:
INC&curx
620 .intr LD&diry:BNEintu:LD&acu
ry:BERintu2:DEC&cury:JMPprinv:.int
u2 LD&1:ST&diry:INC&cury:JMPprinv
:.intu LD&acury:CMPI&28:BERintd:INC
&cury:JMPprinv:.intd LD&8&C1:ST&fl
ag:LD&0:ST&diry:DEC&cury
630 .prinv LD&curx:LD&cury:JSRc
alc:LD&ad:STAns:LD&ad+1:STAns+1:L
D&ad:STAnd:LD&ad+1:STAnd+1:LDX&2:
LDY&16:JSRsprite
640 LD&acury:CMPI&21:BC&prpriv:JSR
random:CMPI&25:BC&prpriv:JSRbomb:.
prpriv
650 LD&acury:CMPI&26:BC&nxtinv:LD
&acurx:SEC:SB&shpx:CLC:ADC&1:CMPI&3
:BC&nxtinv:LD&8&FF:ST&dead
660 .nxtinv BITflag:BMI&nign1:JM
Pign1:.nign1 LD&3:ST&bulx:.bulin
v LDYbulx:LD&bulx,Y:SEC:SB&curx:C
MP&2:BC&shinv:.nsh12 JMPnshinv:.s
hinv LD&bulx,Y:SEC:SB&cury:CMPI&2:
BC&nsh12
670 BITflag:BVC&10:JSRinsec:sc
10 JSRinsec:JSRpac:LD&0:ST&flag:I

```

```

N&shot
680 LD&curx:LD&cury:JSRcalc:LD&
ad:STAos:LD&ad+1:STAos+1:LD&858:
STAod:LD&850:STAod+1:LDX&2:LDY&1
6:JSRprint
690 LDYbulx:LD&bulx,Y:TAX:LD&abu
ly,Y:PHA:LD&8&FF:ST&bulx,Y:PLA:TA
Y:JSRcalc:LD&ad:STAos:LD&ad+1:STA
os+1:LD&848:STAod:LD&850:STAod+
1:LDX&1:LDY&8:JSRprint
700 LD&zap MOD256:LDY&zap DIV2
56:LD&7:JSR&FFF1
710 .nshinv DEC&bulx:BMI&nign1:JMP
bulinv:.nign1
720 LDYinvpt:LD&origx:ST&origxt
,Y:LD&origy:ST&origyt,Y:LD&acurx:S
T&acurxt,Y:LD&acury:ST&acuryt,Y:LD&
dirx:ST&adirxt,Y:LD&diry:ST&adiryt,Y
:LD&flag:ST&flagt,Y
730 DEC&invpt:BMI&cosx:JMPinvlp:.
cosx
740 JSRmbula:BIT&FF:BMI&kill
750 JSRwait:LD&dead:BNE&kill:LD&
shot:CMPI&26:BE&kill:JMPmainlp:.k
ill RTS
760 .wait BITtimer:BMI&wait:LD&#
253:STATimer:LD&19:JSR&FFF4
770 .stars LDX&39:.stlp JSRpat
780 INC&tf,X:LD&astf,X:CMPI&8:BNE
nxts:LD&0:ST&astf,X:LD&astl,X:CLC:
ADC&840:ST&astl,X:LD&asth,X:ADC&1:S
T&asth,X:BPLnxts
790 .news JSRrandom:AND&7:ST&tm
pe:JSRrandom:AND&31:CLC:ADC&tmpe:S
T&tmpe:TAX:LDY&0:JSRcalc:LDXtmpe:
LD&ad:ST&astl,X:LD&ad+1:ST&asth,X
800 .nxts JSRrandom:PHA:AND&2:S
T&tmpe:PLA:AND&1:ASLA:ASLA:ASLA:A
SLA:ASLA:CLC:ADC&tmpe:ST&astf,X:JSR
pst
810 DEX:BPL&tlp
820 .pst LD&astl,X:ST&alo:LD&asth,
X:ST&ahi:LD&astf,X:TAY:LD&astf,X:EOR
(Lo),Y:STA(Lo),Y:RTS
830 .random LD&seed:ROLA:ROLA:R
OLA:SEC:ADC&seed:EORtimer:EORtimer
-1:ST&seed:RTS
840 .fire LD&3:.frlp LD&bulx,X
:BMI&nab:DEX:BPL&frlp:RTS:.fnab LD
&shpx:ST&bulx,X:INC&bulx,X:LD&26:
ST&bulx,X
850 TAY:LD&bulx,X:TAX:JSRcalc:L
D&ad:STAos:LD&ad+1:STAos+1:LD&84
8:STAod:LD&850:STAod+1:LDX&1:LDY
&8:JSRprint
860 LD&7:LDX&gun MOD256:LDY&gu
n DIV256:JMP&FFF1:.gun EQUW2:EQUW
1:EQUW190:EQUW3:.zap EQUW3:EQUW2:
EQUW200:EQUW4
870 .mvbul LD&3:ST&bulx:.bul
p LD&bulx:LD&bulx,X:BMI&nab:TAY:
LD&bulx,X:TAX:JSRcalc:LD&ad:STAos
:LD&ad+1:STAos+1:LD&848:STAod:LD
&850:STAod+1
880 LD&bulx:DEC&bulx,X:BPL&tos:L
DX&1:LDY&8:JSRprint:JMPnxbul:.sto
s LD&os:SEC:SB&840:ST&Ans:LD&os+1
:SB&1:ST&Ans+1
890 LD&ad:ST&And:LD&ad+1:ST&And+1
:LDX&1:LDY&8:JSRsprite
900 .nxbul DEC&bulx:BPL&bullp:JMP
mvboms
910 .score EQU&0:.schd EQU&30:E
QU&10:EQU&17:EQU&2
920 .insec SED:LD&score:CLC:ADC&#
2:ST&score:LD&score+1:ADC&0:ST&sc
ore+1:CLD
930 LD&score:BNE&nul:LD&score+1
:AND&8F:BNE&nul:LD&lives:CMPI&9:BE
&nul:INC&lives:JSRbeep:JSRbeep:JM
Ppliv:.nwl RTS
940 .beep LD&7:LDX&lives1 MOD25
6:LDY&lives1 DIV256:JSR&FFF1:LD&7
:LDX&lives0 MOD256:LDY&lives0 DIV25
6:JMP&FFF1
950 .lives1 EQUW1:EQUW-15:EQUW20
0:EQUW5:.lives0 EQUW1:EQUW0:EQUW0:
EQUW5
960 .pac LD&0:.sachd LD&schd,X
:JSR&FFEE:INX:CMPI&2:BNE&schd
970 .hisc LD&score+1:JSRbyte:LD

```





```

Ascore:JSRbyte:LDA#48:JMP&FFEE:.b
yte TAX:LSRA:LSRA:LSRA:LSRA:JSRn1
b:TXA:AND#8F
980 .n1b CLC:ADC#48:JMP&FFEE
990 .phis LDAAscore:STA#50:LDAAs
core+1:STA#51:LDA#52:STAAscore:LDA#
53:STAAscore+1:JSRhis:STA#50:STA
score:LDA#51:STAAscore+1:RTS
1000 .lives EQU00D:.livh EQU017:E
QU02:EQU031:EQU011:EQU01
1010 .pliv LDY#0:.livhd LDA(livh,
X:JSR&FFEE:INX:CMPI:BNELivhd:LDA
lives:CLC:ADC#47:JMP&FFEE
1020 .bomb LDY#19:.sbo1p LDAbomy
,Y:CMPI#30:BCSfnus:DEY:BPLsbo1p:RT
S:.fnus LDACurX:STAboMx,Y:TAX:LDA
CurY:CLC:ADC#2:STAboMx,Y:TAY
1030 JSRcalc:LDAad:STAos:LDAad+1
:STAos+1:LDA#50:STAod:STAod+1:LD
X#1:LDY#8:JMPprint
1040 .mvboms LDA#19:STAbulS:.mbo
lp LDYbulS:LDAboMx,Y:CMPI#30:BCSx
tbo
1050 LDA#50:STAod:STAod+1:STAnd
:STAnd+1:LDAboMx,Y:TAX:LDAboMx,Y:
TAY:JSRcalc:LDAad:STAos:LDAad+1:S
TAos+1
1060 LDYbulS:INCBomy,X:LDAos:CLC
:ADC#40:STAns:LDAos+1:ADC#1:STAn
s+1:LDX#1:LDY#8:JSRsprite
1070 LDYbulS:LDAboMx,X:CMPI#27:BC
Cnxtbo:LDAboMx,X:SEC:SBCshpx:CMPI
3:BCSnxtbo:LDA#FF:STAdeed
1080 .nxtbo DECbulS:BPLmbo1p:RTS
1090 JNEXT
1100 DIMnames 96,hiscor 16:FORN
=0T07:$ (names+12*NX)=CHR$17+CHR$3
+"Tony":acX=12-NX:hiscor?(NX*2+1)
=acXMOD10+16*(acXDIV10):hiscor?(N
X*2)=0:NEXT
1110 ENDPROC
1120 DEFPROCd(AS,XX,YX):VDU31,XX

```



```

,YX:AX=10:XX=856:YX=0:FORN=1TOLE
NAS:7856=ASC(MID$(AS,NX)):CALL&FF
F1:VDU23,224,7857,7857,7858,7858,
7859,7859,785A,785A,224,8,10,23,2
24,785B,785B,785C,785C,785D,785D,
785E,785E,224,11:NEXT:ENDPROC
1130 DEFPROCdhisc(addrX):7852=?a
ddrX:7853=addrX?1:CALLphis:ENDPRO
C
1140 DEFPROCtitle:VDU22,5,23,1,0
,0,0,0,19,3,4,0:~FX12
1150 COLOUR1:PROCd("ELIMINATOR",
5,1):VDU31,3,4,90,8,10,88,8,10:PR
INT"RETURN":COLOUR3:PRINTTAB(5,4)
"....."TAB(5,5)"....."TAB(10,6)
"..."
1160 COLOUR2:PRINTTAB(13,4)"Left
"TAB(12,5)"Right"TAB(13,6)"Fire"
1170 COLOUR3:PRINTTAB(2,8)"Extra
ship every"SPC(6):COLOUR1:PRINT
"10000 ";COLOUR3:PRINT"points"
1180 COLOUR2:PROCd("HI-SCORES",5

```

```

,11):FORN=0TO7:COLOUR3:PRINTTAB(
1,NX*2+14):NX+1" ";COLOUR2:PROCd
hisc(hiscor+NX*2)
1190 COLOUR1:PRINT" $(names+NX*
12):NEXT:IFflag2PROCinput:flag2=0
1200 COLOUR2:PROCd("Press SPACE
to play",0,30):PROCstara:OSCLI"FX
21":REPEATCALLstara:UNTILINKEY(2)
=32:OSCLI"FX11":ENDPROC
1210 DEFPROCinput:VDU23,1,1,0,0;
0;NX=-1:REPEAT:NX=NX+1:UNTIL$(na
mes+NX*12)="" :VDU31,9,NX*2+14,17,
2
1220 1850=names+NX*12:7852=11:78
53=32:7854=126:OSCLI"FX21":AX=0:X
X=850:YX=0:CALL&FFF1:VDU23,1,0,0;
0,0;ENDPROC
1230 DEFPROCshuffle:hiscor?14=?a
core:hiscor?15=score?1:$ (names+84
)=":FORN=7TO1STEP-1
1240 ax=hiscor?(NX*2)+256*hiscor
?(NX*2+1):bx=hiscor?(NX*2-2)+256*
hiscor?(NX*2-1):IFax>bxPROCswap
1250 NEXT:ENDPROC
1260 DEFPROCswap:hiscor?(NX*2)=b
XMOD256:hiscor?(NX*2+1)=bxDIV256:
hiscor?(NX*2-2)=aXMOD256:hiscor?(
NX*2-1)=aXDIV256
1270 a$=$(names+NX*12):$(names+N
X*12)=$(names+NX*12-12):$(names+N
X*12-12)=a$:ENDPROC
1280 DATA0,10100000,E0E04000,FEF
4E0E0,0,0,1C141410,1E1E1E1C,F4FDF
4FE,F0F4FEFE,60404000,E0E0E06,1C1C
1E1E,81C,F4FEFEF4,E0F0
1290 DATA6060E0E,206,40404040,4A
4A4A4A,EAEAEAEA,40404040,68DE0C0B
,34347A7A,C2DE060Z,8484CACA,3C3B3
53D,C1C3C,8686848D,60686
1300 REM Download
1310 *K.O *T.MIX=PAGE-BE00:FORJ
X=PAGE TO TOP:STEP4:!(JX-1X)=!JX:
NEXT:PAGE=BE00MOLDRUNH
1320 *FX138,0,128

```

electron  
user

MAIL ORDER OFFERS

electron  
user

MAIL ORDER OFFERS



£4.95 each

Here's your chance to get your hands on Impact's best selling games, for just £4.95 each on cassette. That's right, we are offering Zenon, Clogger and Orbital for the incredible price of only £4.95 each!



TO ORDER PLEASE USE THE FORM ON PAGE 51



# Pretty as a picture

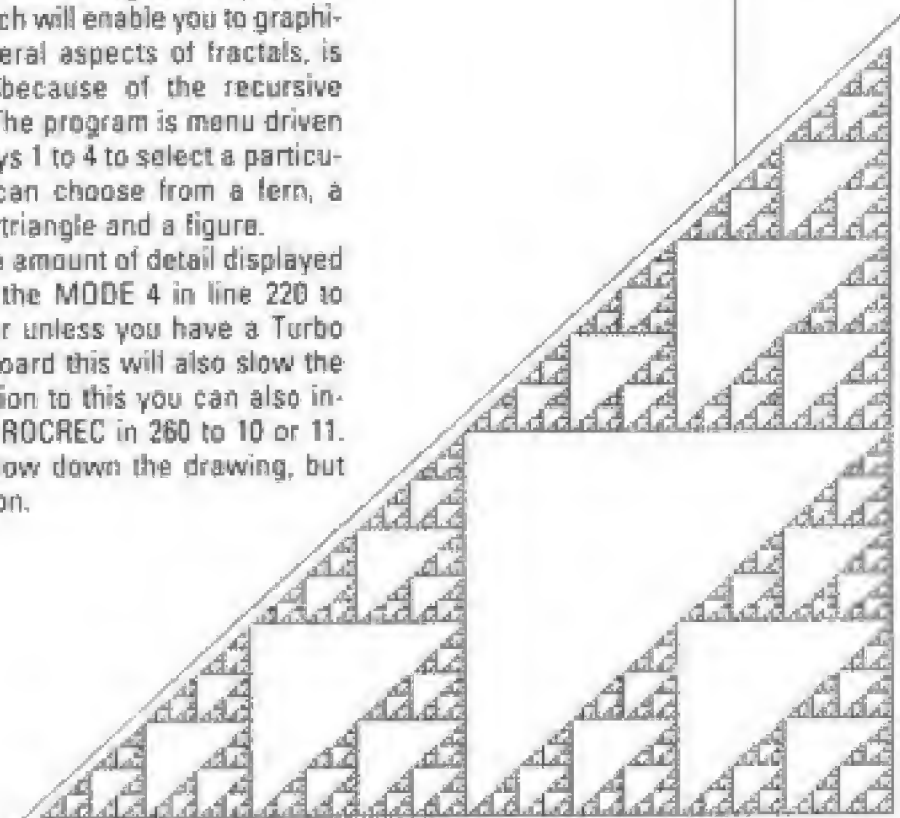
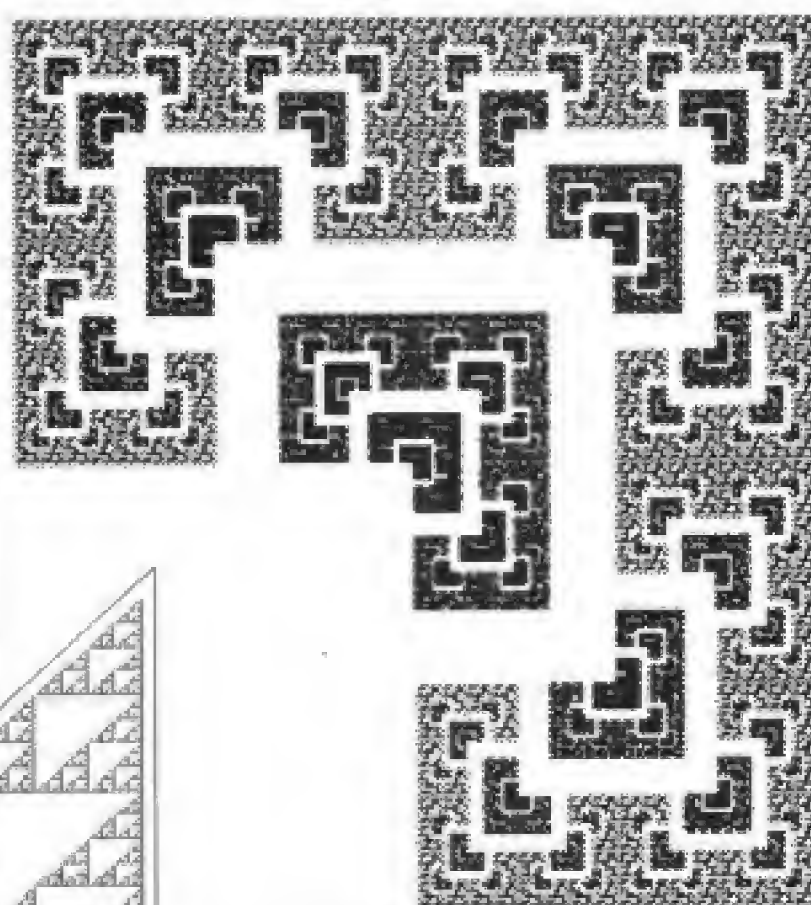
**Michael Rozdoba shows how to draw impressive fractals making use of a clever recursive technique**

**T**HE subject of fractals has been explored in *Electron User* several times, but like the very nature of fractals itself, the closer you look the more interesting details you see.

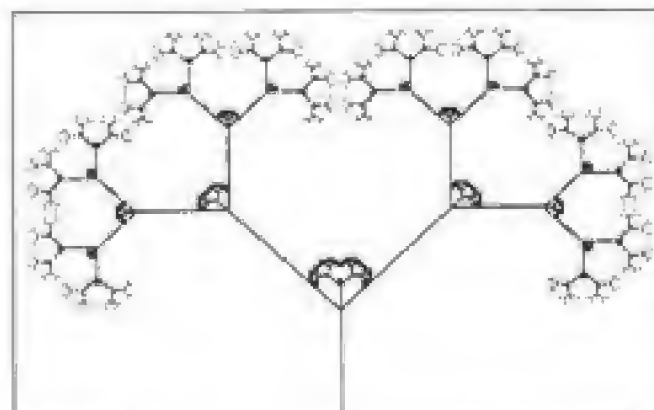
This listing, which will enable you to graphically explore several aspects of fractals, is extremely short because of the recursive technique used. The program is menu driven — simply press keys 1 to 4 to select a particular picture. You can choose from a fern, a tree, a Sierpinski triangle and a figure.

To increase the amount of detail displayed you can change the MODE 4 in line 220 to MODE 0, however unless you have a Turbo or Master Ram Board this will also slow the program. In addition to this you can also increase the 9 in PROCREC in 260 to 10 or 11. Again, this will slow down the drawing, but increase resolution.

*A figure drawn using a recursive technique*



*A Sierpinski triangle*



*A fractal tree*



*The fern*

```

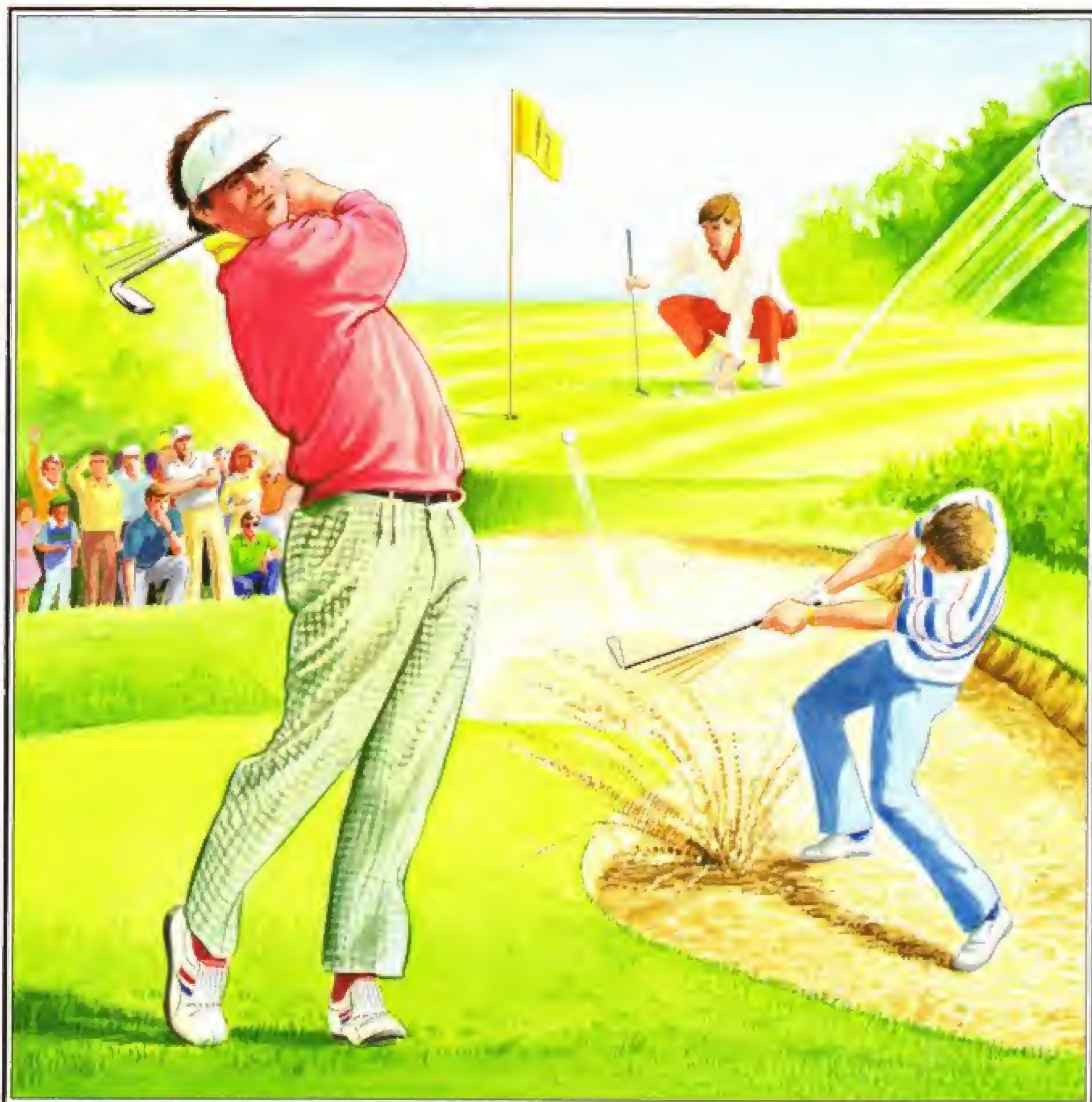
10 REM Deterministic fractal
20 REM generation by recursive
30 REM programming
40 REM By Michael Rozdoba
50 REM (c) Electron User
60 REM Fern
70 DATA 4,120,520,0,0,0,0,.16,
0,0,.85,.04,-.04,.85,0,1.6,.2,-.2
6,.23,.22,0,1.6,-.15,.28,.26,.24,
0,.44
80 REM Tree
90 DATA 4,2000,600,0,0,0,0,.5,
0,0,.42,-.42,.42,.42,0,.2,.42,.42
,-.42,.42,0,.2,.1,0,0,.1,0,.2
100 REM Sierpinski triangle
110 DATA 3,10,0,0,.5,0,0,.5,1,1
,.5,0,0,.5,1,50,.5,0,0,.5,50,50
120 REM Figure
130 DATA 4,1024,0,0,0,-.5,.5,0,
.5,0,.5,0,0,.5,0,.5,0,.5,-.5,0,.5
,1,.333,0,0,.333,.333,.333
140 MODE 6
150 PRINT
160 PRINT "Which fractal?":PRINT
"1. Fern":PRINT"2. Tree":PRINT"3.
Sierpinski triangle":PRINT"4. Fi
gure"
170 K$=GET$

180 RESTORE 70
190 IF K$="2" RESTORE 90
200 IF K$="3" RESTORE 110
210 IF K$="4" RESTORE 130
220 MODE 4
230 VDU 23,1,0;0;0;0;
240 VDU 19,0,7;0;19,1,0;0;:CLS
250 PROCINIT
260 PROCREC(9,0,0)
270 END
280 DEF PROCREC(L,X,Y)
290 IF L=1 PLOT 69,SC*X+XS,SC*Y
+YS:ENDPROC
300 LOCAL QX
310 FOR QX=0 TO NX
320 PROCREC(L-1,X*A(QX)+Y*B(QX)
+E(QX),X*C(QX)+Y*D(QX)+F(QX))
330 NEXT
340 ENDPROC
350 DEF PROCINIT
360 READ NX,SC,XS,YS:NX=NX-1
370 DIM A(NX),B(NX),C(NX),D(NX)
,E(NX),F(NX)
380 FOR QX=0 TO NX
390 READ A(QX),B(QX),C(QX),D(QX)
,E(QX),F(QX)
400 NEXT
410 ENDPROC
    
```



**BBC MICRO  
ACORN ELECTRON  
ARCHIMEDES**

# Holed



*The Fourth Dimension*

## **IDEAL FOR THE BEGINNER OR THE PROFESSIONAL**

Whether you're young or old, male or female, beginner or professional, Holed Out has been designed especially for you. You can play alone or use the varying skill levels to allow up to 4 players of differing abilities to be more equally matched against each other. The game controls have been carefully selected for simplicity so that even the youngest or inexperienced computer user can play Holed Out.

Included with the game is a well thought-out instruction manual giving all the information you will require and individual maps of all the 36 holes.





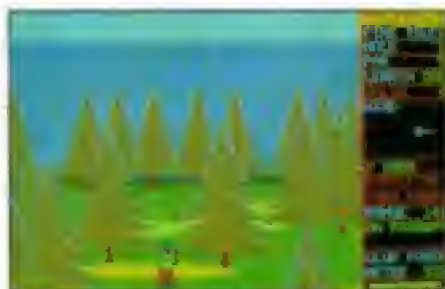
# HOLED

# !!!

**BBC MICRO  
ACORN ELECTRON  
ARCHIMEDES**



Driving off the 1st tee - a dogleg to the right.



Using a 7 Iron to clear the trees.



A good lie in the rough but there's a strong wind.



A long put with a tricky slope to the left.



A long bunker shot soars through the air to the green.



A left-handed player aims to clear the canal with a 3 Wood.



A high Wedge shot from a bad lie in the rough.



The Electron version is identical to the BBC version.

## Designed by Golf Enthusiasts for Maximum Realism

- 1 **Two Contrasting 18 Hole Courses** - Once you've mastered the easier first course you should be ready for the greater challenge ahead.
- 2 **4 Skill Levels for Beginner to Professional** - Learn to play without worrying about the wind, bunkers or rough.
- 3 **1 to 4 Players** - Play alone or with friends. Each player can choose a skill level to suit their ability and thus make the match more even.
- 4 **High Resolution 3 Dimensional Graphics** - A full 3 dimensional view is given for each shot. Watch your player hit the ball into the distance. The shadow of the ball along the ground accurately shows you its progress.
- 5 **Excellent Sound Effects** - Several effects have been added to give extra atmosphere to the game. Hear the ball rattle in as you Hole Out. (An Eagle 'seems' to sound a lot better than a frogie).
- 6 **Full Instruction Manual** - This features easy to follow guidelines, general rules of golf and detailed scale maps of all 36 holes.
- 7 **Reference Chart** - Gives summarised details of the maximum possible distances obtainable from each club. Also included are tips on how to deal with course hazards.
- 8 **Realistic Ball Flight Paths** - A great deal of attention has been paid to making the ball behave how it should in the real world.
- 9 **Variable Wind on Each Hole** - Wind varies significantly and can be blowing from any direction. Every round you play will be unique.
- 10 **Slice and Hook Capabilities** - You can use slice or hook to swerve your ball around the various hazards that you will encounter.
- 11 **Full Set of Clubs** - You carry 14 clubs. Woods 1, 3 and 5; Irons 1 to 9; Wedge and Putter.
- 12 **Accurately Defined Club Performances** - Each club's performance has been accurately simulated. You must consider your lie, the distance required, the wind conditions, the height required and the degree to which the ball will bounce and run along the ground.
- 13 **Bunkers, Trees, Water and Variable Rough** - These are best avoided as the consequences of an encounter have been 'lovingly' recreated.
- 14 **Authentic Greens** - Hazards, such as 'protecting' bunkers, will require you to plan your approach to each green carefully. Once made, the greens can be sloped in any direction and the gradients vary greatly. Putting is an art that will need mastering in its own right.
- 15 **Constantly Updated Full Scoreboard** - You can check your progress with a full record of all the players' performances on each hole.
- 16 **Matchplay or Strokeplay Options** - Play to win the most holes or try to get the lowest overall number of shots.
- 17 **Designed by a Team of Golf Enthusiasts** - as if you haven't guessed.
- 18 **All Versions Programmed by the Highly Acclaimed Programmer Gordon Kay** - The above screenshots are taken from the BBC & Electron versions.

### HOW TO GET HOLED OUT

Holed Out is available now from most good games outlets. If there isn't a stockist near you then we offer an instant mail order service. Simply send us a quick letter telling us the version you require, your name and address, and payment via cheque, postal order or Access Card details. Your copy of Holed Out will be sent by First Class Post on the SAME day we receive your letter. We pay the postage and packing (overseas add £3). Telephone orders with Access are also welcome.

### HOLED OUT PRICES

BBC B/Master Cassette	£12.95
Acorn Electron Cassette	£12.95
BBC B/Master 5 1/4" Disc	£14.95
Master Compact 3 1/2" Disc	£15.95
Archimedes 3 1/2" Disc	£19.95

BBC and Electron versions available now.  
Fully enhanced Archimedes version available from 3rd April, 1989.

The Fourth Dimension, P.O. Box 4444, Sheffield. Telephone (0742) 700661.



*The Fourth Dimension*

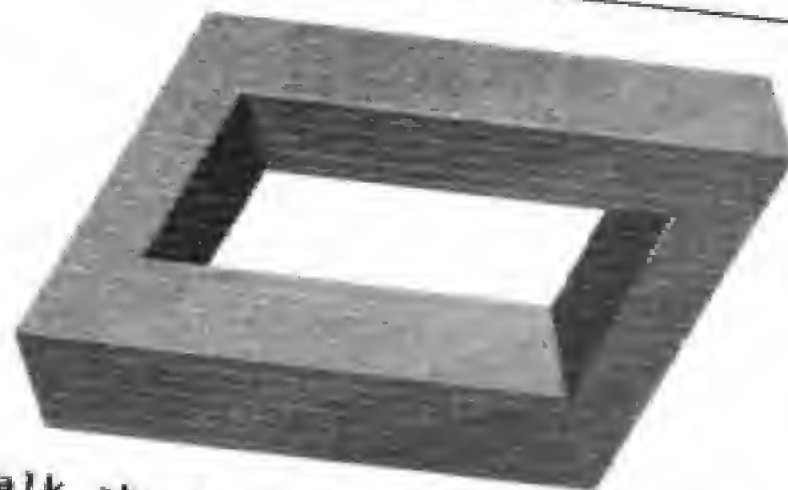


# LINERS

**T**HIS month's double helping of 10 liners consists of a collection of optical illusions created by Jim Proctor of Louth, Lincolnshire. These mini programming marvels are very compactly written and make good use of the Electron's superb graphics.

Three are written in four colour Mode 1 and the other two are monochrome Mode 4. The programs make heavy use of READ and DATA, as the coordinates for plotting the shapes are stored at the end of the listings.

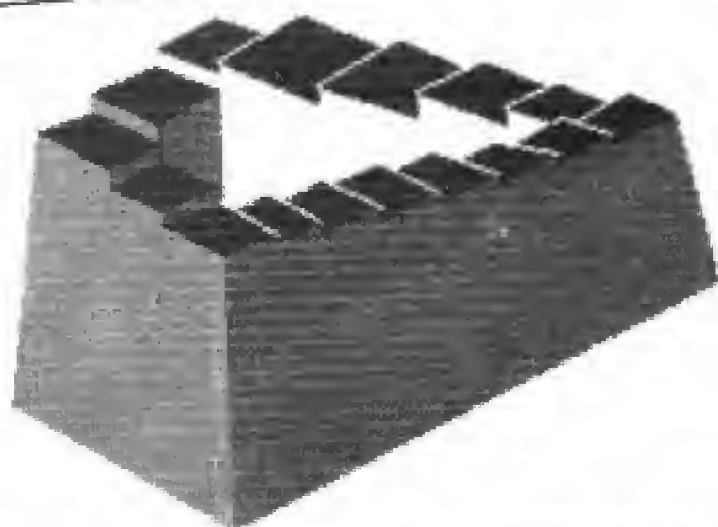
Has anyone created any other optical illusions?



Talk about knickers in a twist!

```
1 REM The Escher Rectangle
2 MODE1:VDU5,19,1,2,0;19,2,5;
0;19,3,4;0;23;8202;0;0;0;:PROCrec
:REPEATUNTILINKEY-74:RUN
3 DEFPROCrec
4 FORPX=1TO3:READcx,jx,ix:GOTO
LO,cx
5 FORIX=1TO ix:READmx,my,dx
X,dx:MOVEmx,my:DRAWdx,dx
6 FORJX=1TO jx:READpx,py:PL
OT85,px,py:NEXT:NEXT:NEXT
```

```
7 VDU4:PRINTTAB(3,28)-Talk ab
out knickers in a twist!:ENDPROC
8 DATA1,6,1,1005,690,1050,600
,295,690,350,600,100,300,250,400,
800,300,770,400
9 DATA2,6,1,150,200,100,300,8
50,200,800,300,1050,600,910,520,3
50,600,390,520
10 DATA3,2,2,350,600,390,520,2
50,404,330,404,800,300,770,400,90
0,516,820,516
```



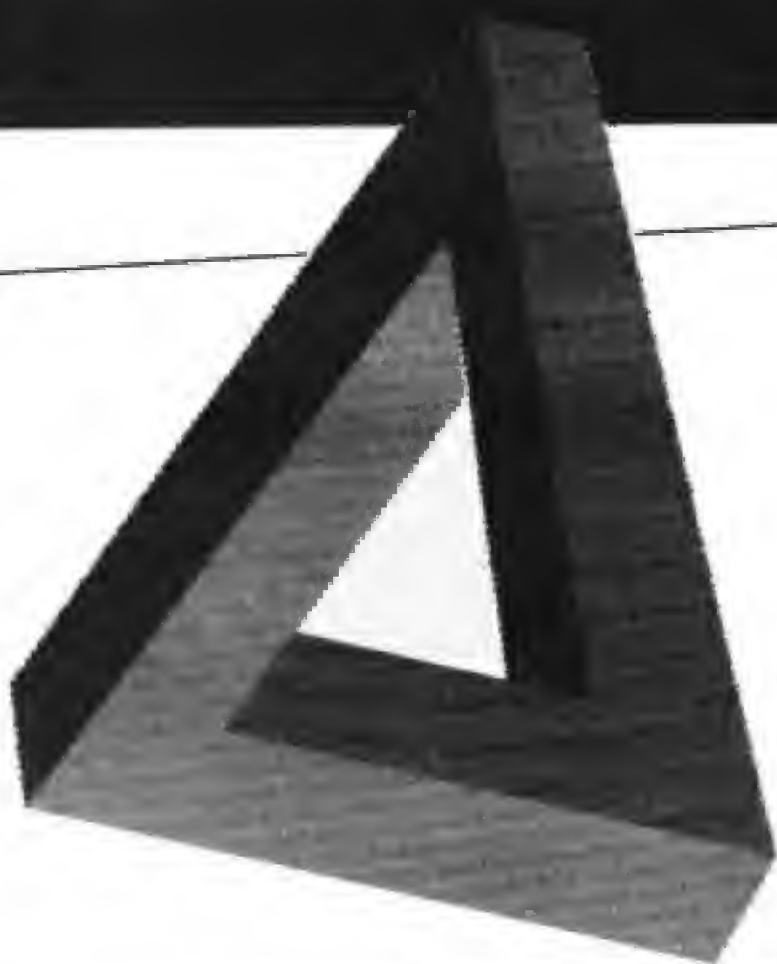
Maybe it will sell for jogging practice

```
1 MODE1:VDU19,1,4;0;19,2,6;0;
19,3,7;0;23;8202;0;0;0;:RESTORE4:
FORN=1TO9:PROCplot:NEXT:PROCline(
3,1):PROCline(0,13):VDU4:PRINTTAB
(1,28)"Maybe it will sell for
jog
ging practice":REPEATUNTILINKEY-7
4:RUN:REM Escher Stairway
2 DEFPROCline(cx,jx):GCOLD,cx
:FORIX=1TO jx:READmx,my,dx,dyX
:MOVEmx,my:DRAWdx,dx:NEXT:END
PROC
3 DEFPROCplot:READcx,jx,ix:GC
OLD,cx:FORI=1TO ix:READmx,my,dx
X,dx:MOVEmx,my:DRAWdx,dx:FOR
J=1TO jx:READpx,py:PLOT85,px,p
```

```
YX:NEXT:NEXT:ENDPROC
4 DATA1,8,1,400,220,400,535,1
30,370,325,570,325,585,130,370,26
0,615,260,635,130,370,175,680,1,2
1,240,700,325,660,240,720,325,68
0,0,2,1,325,770,400,740,325,750,4
00,720
5 DATA2,23,1,1020,480,975,675
,400,220,895,640,895,655,400,220,
825,620,825,635,400,220,750,600,7
50,615,400,220,675,580,665,595,40
0,220,600,565,600,580,400,220,525
,555,525,570,400,220,470,545,470,
555,400,220,400,535
6 DATA2,5,1,400,720,400,610,3
25,680,325,640,325,660,260,615,26
```

```
0,635,2,2,1,325,570,400,595,325,5
85,400,610,3,2,4,325,570,400,535,
400,595,470,555,260,615,325,585,3
25,640,400,610,175,680,260,635,24
0,700,325,660,240,720,325,750,325
,680,400
7 DATA720,3,3,11,400,740,325,
770,400,755,400,800,460,780,525,7
00,400,755,525,720,505,800,610,76
0,650,680,525,720,650,710,630,770
,720,730,760,670,650,710,760,690,
735,740,815,710,895,640,975,675,8
95,655,915,700,850,670
8 DATA825,620,895,655,825,635
,835,675,770,645,750,600,825,635,
750,615,750,650,700,630,675,580,7
50,615,675,595,670,640,620,620,60
0,565,675,595,600,580,600,630,540
,610,525,555,600,580,525,570,525,
615,480,595
9 DATA470,545,525,565,470,555
,460,600,420,585,3,4,1,820,670,76
0,690,835,675,825,715,850,670,890
,690,325,680,325,640,400,755,505,
800,820,670,835,675,525,720,630,7
70,650,710,735,740,760,690,825,71
5,850,670,915,700
10 DATA835,675,895,655,750,650
,825,635,670,640,750,615,600,630,
675,595,530,615,600,580,460,600,5
25,565,400,595,470,555
```





```

1 REM The Escher Triangle
2 MODE1:VDU23;8202;0;0;0;:PRO
Ctrl:REPEATUNTILINKEY-74:RUN
3 DEFPROCtri
4 MOVE100,100:DRAW250,60:DRAW
1200,480:DRAW1200,600:DRAW250,950
:DRAW100,900:DRAW100,100
5 MOVE250,60:DRAW250,700:DRAW
730,520:DRAW920,580:DRAW100,900:M
OVE390,650:DRAW390,300:DRAW1200,6
00:MOVE390,400:DRAW730,520
6 VDU4:PRINTTAB(23,26)"Feelin
g twisted?"TAB(16,28)"- it's worse

```

```

e in colour!"TAB(25,30)"Press spa
ce...":REPEATUNTILINKEY-99:VDU19,
1,4;0;19,2,5;0;19,3,6;0;5,16
7 GCOL0,1:MOVE250,60:DRAW100,
100:PLOT85,250,700:PLOT85,100,900
:PLOT85,730,520:PLOT85,920,580
8 GCOL0,3:MOVE100,900:DRAW250
,950:PLOT85,920,580:PLOT85,1200,6
00:PLOT85,390,400:PLOT85,390,300
9 GCOL0,2:MOVE390,650:DRAW250
,700:PLOT85,390,300:PLOT85,250,60
:PLOT85,1200,600:PLOT85,1200,480
10 ENDPROC

```

IS IT A VASE...

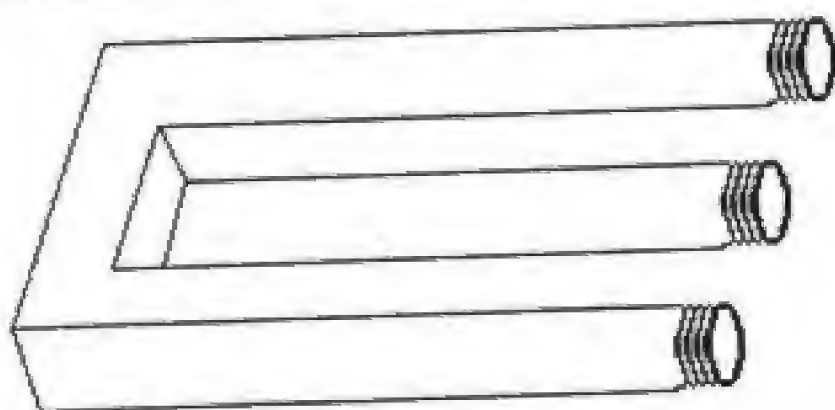


OR TWO FACES...

```

1 REM Two-faced vase
2 MODE4:OSCLI("FX9,200"):OSCL
I("FX10,200"):VDU5,19,1,0;0;23;82
02;0;0;:PROCvase:REPEATUNTILINK
EY-74:OSCLI("FX9,25"):OSCLI("FX10
,25"):RUN
3 DEFPROCvase
4 MOVE350,800:RESTORE10:FORnX
=1TO23:READxX,yX:DRAWxX+80,yX:NEX
T
5 MOVE929,800:RESTORE10:FORnX
=1TO23:READxX,yX:DRAW1199-x2,yX:N
EXT
6 MOVE350,800:DRAW929,800:MOV
E270,150:DRAW1009,150
7 FORyX=154TO796STEP4:PLOT77,
640,yX:NEXT
8 VDU4,19,128,132;0;19,1,8;0;
:PRINTTAB(12,3)"IS IT A VASE...?"
TAB(12,29)"OR TWO FACES...?"
9 ENDPROC
10 DATA400,700,440,660,470,620
,480,600,480,550,470,530,480,500,
500,460,530,430,520,410,460,410,4
50,380,460,360,430,354,430,346,46
0,340,420,300,430,270,430,240,410
,220,250,200,200,170,190,150

```



I knew that CAD program was no good!

```

1 REM A peg too many
2 MODE4:VDU23;8202;0;0;0;19,1
28,132;0;19,1,3;0;:PROCpeg:REPEAT
UNTILINKEY-74:RUN
3 DEFPROCpeg:VDU5
4 VDU23,230,228,27,18,18,54,3
6,36,109,23,231,147,111,76,76,220
,152,152,184,23,232,192,224,48,48
,56,24,24,28
5 VDU23,233,73,219,219,219,21
9,219,219,73,23,234,48,112,112,11

```

```

2,112,112,112,48,23,235,12,12,12,
12,12,12,12,12
6 VDU23,236,109,36,36,54,18,1
8,27,228,23,237,184,152,152,220,7
6,76,111,147,23,238,28,24,24,56,4
8,48,224,192
7 MOVE928,319:DRAW128,319:DRA
W96,415:MOVE928,415:DRAW96,415:DR
AW224,735:DRAW1056,735:MOVE1056,6
39:DRAW288,639:DRAW224,479:DRAW99
2,479:MOVE288,479:DRAW320,575:DRA

```

```

W288,639:MOVE992,575:DRAW320,575
8 RESTORE10:FORnX=1TO3:READxX
,yX:MOVExX,yX:VDU230,231,232,10,8
,8,8,233,234,235,10,8,8,8,236,237
,238:NEXT
9 VDU4:PRINTTAB(1,28)"I knew
that CAD program was no good!":EN
DPROC
10 DATA1056,735,992,575,928,41
5

```



# 'STARSPELL'

## SPELLING CHECKER

**THE definitive utility for your wordprocessor**

**For use with either STARWORD or VIEW**

STARSPELL has implemented the very latest programming techniques resulting in phenomenal checking speed

STARSPELL is for disk users only & runs under DFS or ADFS

STARSPELL will scan your letter or document in seconds

SLOGGER's STARSPELL can compare words in a fraction of a second by utilising an algorithm based on a 'hashing' technique, which accesses the dictionary disk supplied. The more common words are stored internal to the ROM itself and so comparisons here take just microseconds

From STARSPELL you simply load your text into memory and select the 'Spelling Check' function. Spelling mistakes may be corrected from STARSPELL but the word may be added to the dictionary if considered correct, similarly unwanted words can be deleted

### MAIN FEATURES:

- \* 16K ROM and dictionary disc (see below for options)
- \* DFS and ADFS (ie 3.5" or 5.25")
- \* Very fast (and I mean VERY fast)
- \* Disk capacity: ADFS approx sixty thousand words  
Pegasus DFS approx eighty thousand words
- \* Select 40 or 80 column display
- \* Interactive spelling check (correct mistakes, add to disk, add to temporary store, or ignore mistake)
- \* Auto check with error report
- \* Browse through dictionary
- \* Add words to dictionary
- \* List text
- \* Browse through dictionary
- \* Create new dictionary disk

STARSPELL is available in three different software formats:  
1) 16K ROM and dictionary disc. 2) Cartridge and dictionary disk. 3) VIEW and STARSPELL on one cartridge and dictionary disk. Send your original VIEW cartridge for part exchange.

PLEASE SPECIFY DISK TYPE AND FILING SYSTEM (eg 3.5"ADFS,etc)

### OPTION PRICES:

STARSPELL 16K ROM & DICTIONARY DISK .....£29.95  
STARSPELL CARTRIDGE & DICTIONARY DISK .....£31.45  
STARSPELL & VIEW ON CARTRIDGE & DICTIONARY DISK .....£33.95  
(send original VIEW cartridge)

SEE NEXT PAGE FOR OUR ORDER FORM

**STARSPELL credit card hotline: 0272 743683**





**SLOGGER**

Send 28p stamp for  
comprehensive  
catalogue of full  
product range

## PEGASUS 400

Highest quality complete disk drive system for the Electron. The PEGASUS system comprises of:

Pegasus Interface using standard 'BBC DFS' – simply plugs into Rombox+ or Plus 1.

5.25" Mitsubishi Double sided 80 Track Drive with PSU

### PACKAGE PRICES

PEGASUS 400 .....	£149.50
PEGASUS 400 + Rombox Plus + T2PEG400 .....	£199.00
PEGASUS 400 + Rombox Plus + T2PEG400 + Starword + Starstore II .....	£225.00
PEGASUS INTERFACE only .....	£49.00 New Low Price

## ROMBOX PLUS

SLOGGER's answer to the PLUS 1

The ROMBOX PLUS has this improved specification:

1. Four ROM/RAM sockets to free the cartridge slots for more important add-ons. Each socket can take the usual 8K/16K ROMs but can also take 16K RAMS offering a staggering 64K SIDEWAYS RAM
2. The PLUS1 Cartridge slots.
3. The PLUS1 centronics printer port.
4. The Expansion ROM 2.0
5. Switched Joystick interface available.
6. Analogue Joystick interface under development.

Still Only £54.95

### STARWORD (16K ROM) (BBC/ELECTRON)

\*Does everything VIEW does plus MUCH MORE!

Designed for the home user, education or small business needs, STARWORD enables even those with limited typing skills to produce and print letters, manuals, reports or any large document.

\*Very extensive printer control facilities including BOLD, UNDERLINE, and WIDE immediately available.

\*Proper mailmerge with STARSTORE and STARSTORE II for producing standard letters.

\*Internal printer driver for Epson compatible printers.

\*Printer Driver Generator ROM available to permit use of most non-Epson compatible printers.

STILL ONLY £19.95

STARWORD & STARSPELL  
on a cartridge ONLY £45.00

### JOYSTICK INTERFACE

for ROMBOX PLUS or ACORN PLUS 1

- Uses inexpensive ATARI-type joysticks
- Compatible with ALL Tape and Disk systems.
- Emulation of keys by Expansion ROM 2.0
- Can be used with well written games either WITH OR WITHOUT A JOYSTICK OPTION

"The ultimate Joystick Interface"

A&B July 87

"Well worth saving up for, I can recommend it to all Arcade Addicts"

Electron User May 87

Only £14.95

- Requires Electron Expansion 2.0
- Only £5 with this unit

### ROM SOFTWARE

STARSTORE2	Disk Database .....	£19.95
STARSTORE	Database .....	£11.95
STARGRAPH	Graphic Utilities .....	£11.95
ELKMAN	ROM/RAM Manager .....	£11.95
STARMON	Machine code Monitor .....	£11.95
PRINTER ROM	Simplified Printer Control .....	£11.95
STAR TREK	Machine code disassembler .....	£11.95
POG	Printer Driver .....	£11.95

### EXPANSION ROM 2.0

for ROMBOX PLUS or PLUS 1

- Supports Printer Buffer with 8K/16K sideways RAM or 12K with MASTER RAM BOARD.
- RSAVE command to save ROM images to tape or disc.
- RLOAD command to load Sideways RAM with a ROM image.
- ROMS command to display ROM/RAM in system.
- JOYSTICK command for the SLOGGER Joystick Interface
- Allows cassette loading in high resolution.
- Supports all standard functions (Printer, ADC, RS423)
- Simply fits into internal ROM socket.
- "There is room for improvement in the operating system. No doubt this was the idea behind Expansion 2"

Electron User, July 87

Only £11.95

(£7.95 if purchased with 32K SIDEWAYS RAM or JOYSTICK INTERFACE)

**SEND  
FOR  
THEM  
TODAY**

Cheques payable to  
SLOGGER LTD. Tel: 0272 237496

☐ Access No. ....

☐ Visa .....

Name .....

Address .....

Expiry Date

PLEASE SUPPLY

Cost

1 ..... £ .....

2 ..... £ .....

3 ..... £ .....

4 ..... £ .....

5 ..... £ .....

Total £ .....

Please send orders to SLOGGER LTD, 7 APSLEY ROAD, CLIFTON, BRISTOL BS8 2SH

## MASTER RAM BOARD

Upgrade your Electron to a 64K Machine

- Fits inside the Acorn Electron, uses no cartridge ports.
- Compatible with ALL reliable Electron hardware (except TURBO DRIVER).
- Compatible with ALL Electron software, switching between 64K mode, TURBO mode (yes... the TURBO DRIVER IS BUILT IN), and normal mode.
- For correctly written software, HIMEM is ALWAYS AT 8000 in 64K mode so leaving 28000 bytes for BASIC or WORD PROCESSING in ALL screen modes.
- Doubles the speed of Word Processing.
- Upto 300% speed increase for games.
- Additional 12K for use as Printer Buffer with Expansion ROM 2.0.
- Installation Service (See Details below) for those not confident of desoldering the 6502 Microprocessor

### NEW FEATURES

- 64K Mode fully compatible with 98% of Level 9 BBC Adventure games.
- NEW OS 3.0 – PLAY ACORNSOFT'S ELITE WITH SLOGGERS JOYSTICK INTERFACE.

Master RAM Board Kit – code MR2 – Now Only £49.95

## INSTALLATION SERVICE

Send your computer to us and we will upgrade and return your computer within 48 hours. (Also send your Plus 1)

Order MR1 £59.95 (Including MR2)

CALLERS – Please Ring to arrange for a fitting installed within the hour! (No extra Cost)

### DISKS

5.25" DS/DD BOX 10  
£8.95 + £1 P&P

## TAPE TO DISK ROMS VERSION 2

- Transfer the majority of Tape programs to disk
- Compatible with programs copied using Version 1
- More successful than ever before

T2P3 for the Acorn Plus 3  
T2CU for the Cumana DFS  
T2P4 for AP4 and ECO DFS  
T2SD for the Solidisk DFS  
T2SEDFS for the SEDFS  
T2PEG400 for Pegasus 400

ONLY £24.95

- Upgrade 1-2 only £5 with original ROM

## SLOGGER EPROM CARTRIDGE

- Carries TWO 8K/16K ROM/EPROM software
- Compatible with PLUS 1, ROMBOX PLUS and BBC Master.
- Simply plugs into cartridge slot

£12.00

See last months advert for our product range or send a 28p stamp for our FULL range in the catalogue



# Adventures

By Pendragon

## The rites of spring

**S**UNSHINE is washing against the battlements, the deer are courting in the forest and I really must clean my armour. With spring upon us we once more hold forth and impart that which is new. From Labyrinth Software comes news of a new release with the breathtaking title Quest for the Pendragon. It was written using Incentive's Adventure Creator with a patch introduced by the author, Michael Cargill, to allow the game to also run from disc on Electrons fitted with the Pres Plus 4 DFS interface.

This also means that Michael is now able to release his earlier adventure, Plane Crash, on disc for the Electron.

Quest for the Pendragon is a real Arthurian teaser – it certainly had me foxed at one or two points. The game allows multi-statement lines and also includes a novel feature of a random

chance of capture. Watch for a review in a coming issue.

It is pleasing to see more and more games emanating from dedicated adventurers who have used experience gained in solving adventures to write new and exciting romps. Casting an eye over recent releases I gain the clear impression of player, programmer, product and machine maturing alongside each other.

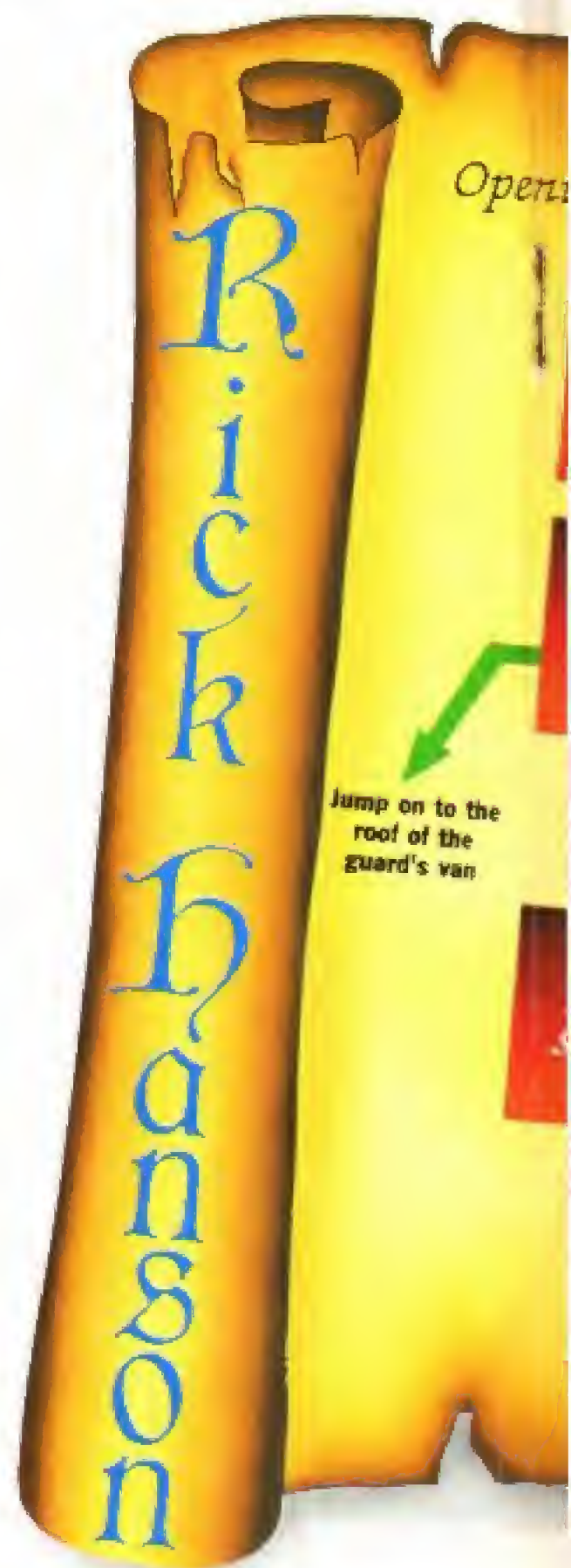
Further to my ramblings in the March issue I have received a number of letters from readers asking whether The Quill is still available for the Electron. My investigations have brought no reward, so can any reader or company help with the name of a supplier who may still have stocks of Gilsoft's superb adventure writing aid?

I would also be grateful for any pictorial maps of any of the Level 9 series of adventures – particularly Colossal Adventure. I already have logical routes for all its titles, but due to the personal nature of logical routes they are often difficult to transcribe on to the page for all readers to understand.

Suitable software prizes also await the senders of the first full maps to Scott Adams' Adventureland or Micro Power's Adventure.

Finally, this month's featured map is of the opening scenario to Robico's Rick Hanson. This should help many adventurers who are stuck at the outset of this classic spy adventure. Next month I'll continue this series with a guide to the openings to Woodbury End.

● That's it for this month, so until the sun goes down on the dungeons, happy adventuring.



### Adventurer's Glossary

**Wadi:** A place to drink in the desert. Fill your bottle here.

**Wand:** Try waving it.

**Wardrobe:** Remember Narnia? Well try entering it.

**Water:** If you don't want to die two feet from the well, take a plentiful supply of this commodity.

**Web:** Don't get caught in it. You may need a sharp knife or sword to escape.

**Well:** A place to get water, but also try climbing down the rope or getting someone to lower you down in a bucket.

**Werewolf:** A silver bullet or wolfsbane will put paid to his tricks.

**Wights:** Carry a cross and a crucifix to keep off these evil creatures.

**Will o'wisp:** Try taking it.

**Windlass:** The part of the well on which the rope is coiled.

**Windmill:** Will need careful exploring. The sails, grain store and machinery housing are all of importance.

**Winhurst generator:** This is an early device, consisting of two spinning discs, for generating very large voltages. Used by Professor Frankenstein.

**Witch:** Beware she is devious and may try to

appear as something she isn't.

**Witts End:** In Classic and Colossal adventures you must leave something here for a bonus.

**Woodcutter:** He is an honest sort of chap but has a violent temper, so take care if you try to pinch his axe.

**Worm:** Perhaps the one that turned, or even the one in paradise.

**Wrath:** Best left alone unless your magic is strong enough.

**Ygor:** Professor Frankenstein's loyal assistant. Can be quite a nasty adversary.

**Zombie:** You must find some way of killing or avoiding it. On the whole they don't enjoy having their heads smashed in.



ing gambit map number 4



## Readers Hall of Fame

### Kingdom of Hamil – Mike Campbell

This is a continuation of last month's solution which involves help with specific sections of the adventure rather than a step by step audit trail.

**The Plains:** This is the least agonising of the mazes in this adventure. Drop the well-fed Hexapod and follow him South West, South West, South East, South West and South East. You will receive some pearls as a reward from his worried mother.

Return across the plains North West, North East, North West, North East and North East – logical really.

### The treasures:

**Tapestry:** It is very heavy and can be found in the Tapestry room. Get the bottle and open it so the djinn can carry the tapestry for you.

**Documents:** Kill the vampire and you will find these in his sinister chamber.

**Bust:** Found in the cave at the end of your trek through the Lost World.

**Pearls:** Given to you by mummy Hexapod after returning her son to her waiting arms.

**Ruby:** In the cupboard at the back of the fish room. Use the password *Opreh* to open the door.

**Folio:** In the cave in the forest. Follow the forest

instructions to get into the cave.

**Painting:** Found in the field of maize.

**Helmet:** In the cave, east of the orbicular chamber. Throw water at the wall of fire to enter the cave.

**Sapphires:** At the bottom of the snark tunnels.

**Emeralds:** In the enchantress' room. Eat the garlic to avoid her embraces.

**Ring:** Kill the jackdaw by hurling the Boomerang at it. He will then oblige by dropping the ring.

**Boomerang:** Can be found in the courtyard.

**Statue:** Is in the North room of the museum. Call

Turn to Page 30 ►



# ◀ From Page 29

Adric and the statue will walk to the vault for you.  
**Crozier:** Will be found just beyond the pit.  
**Goblet:** Must be retrieved from the inhuman room.  
**Crown:** In the Quaternion room. Can be collected after completing the Maze of Hamil.

## Other objects

**Steak:** Found in the chapel. Use it to feed the baby Hexapod.  
**Cheese:** Will be discovered North West of the pit. Eat it to dream of Adric.  
**Garlic:** Found in the vault. Eat it to discourage the enchantress.  
**Rod:** Found at the starting location. Must be used to lift the slab.  
**Lamp:** Again will be found at the start. Use the word On to light it.  
**Bottle:** Will be found South East of the enchantress. The djinn lives in it, but it is also useful for carrying water.  
**Egg:** In the west area of the museum's entrance.  
**Talisman:** Can be picked up in the middle of the museum. Useful to ward off the evil spirits in the field of maize.  
**Whistle:** Found after returning from the Lost World. Blow it in the inhuman room and a large dog will deal with the hobgoblin.  
**Poison:** All over the floor in the white dust room. Drop the dead jackdaw in it, then throw the poisoned bird to the beast in the pit.  
**Documents:** Not only a treasure, but your pass to and from Castle Hamil.

# Problems Solved

I begin by offering a smidgen of help to Jonathan Hollingsworth who is having difficulties with Epic's oldie, *The Quest for the Holy Grail*. The following few tips may help Jonathan and others stuck in this adventure – which remains one of my favourites.

At the woodcutter's cottage, ensure you hide the stolen axe under your tunic or you will meet a nasty end.

Match the colour of your sword to the colour of the knight you need to fight. The Black Knight, however, can't be beaten so it is best to avoid him. Don't forget to cut the rope when you make the raft or you will have nothing left to tie it up with when you reach the island. Beware of the damsel in distress, as appearances can be deceptive and fatal.

Ian Jackson writes to ask how to get into Part Two of *The Lost Crystal*. Entry is quite easy really, Ian, just keep climbing down the rope until it snaps.

He also asks for some help with *The Incredible Hulk*. To pull the ring, remember what Dr Strange told you. Also The Hulk has a strong stomach, so examine the egg.

To get the ants to free the Ant Man, you can deflect the beams with the mirror. To get the bio gem without the natter egg exploding, try eating the egg. Meanwhile Jack Greenaway asks for some advice on how to make progress in *Mardon's Quest*. You start in the

master bedroom.

Take the blanket, go South, West and North and take the newspaper. Now travel East, North, East and climb the drainpipe. Now go North, South, West, South and Mordon will appear and explain your quest.

Say Yes, and journey North and East, take the transporter, take the torch and light it then continue North, North, North. That should get any adventurer started.

Phil Booth asks how to get to the castle from the Blue room in *Sphinx Adventure*. This is a question which I have answered on numerous occasions in the past, so for one last time: The quickest route is to go to the spice room then travel West, East, West, South, Down, Down and Up.

You will find the boat at the foot of Castle Hill, and in the castle itself you will meet a vampire who is dying for a stake and a cute mouse which can be tempted by a morsel of cheese.

Finally, Julia Gates asks me to explain the significance of the frame in the church in *Robico's Rick Hanson*.

This gives you the numbers to be used to operate the keypad in the computer alcove. Another point is that the razor has a few different uses. Use it to cut the rope in the church, to give you a close shave and to kill Garantz in the final conflict.

electron  
user

MAIL ORDER OFFERS

electron  
user

MAIL ORDER OFFERS



VOLUME 3  
AVAILABLE  
NOW

Only  
£2.99  
each volume

Programs available  
only on cassette

Just about all the games in your collection can now be cracked – using *Cheat it Again, Joe!*

Each tape contains a massive 20 cheats and they're so easy to use. Just load the cheat before you run the game and you're away – with infinite lives, extra speed, more credits, invulnerability and so on.

Now you can complete those games that have been frustrating you for months.

And for only £2.99 this is the ideal way to bring your games collection back to life.

## Volume 1

Elite	Repton 1	Bonecrusher	Starship Command
Citadel	Repton 2	Killer Gorilla	Arcadians
Ravenhall	Star Wars	Eller	Kourtyard
Thrust	Quest	Living Daylights	Despatch Rider
Plan 9	Thunderstruck 2	Deathstar	Phantom

## Volume 2

Repton 3	Combat Lynx	Palace of Magic	Ransack
Around the World	Paperboy	Islands	Imogen
Life of Repton	Sargon	Impact	Undum
Plan 82	Spycat	Magic Mushrooms	Karate Combat
Codename Brad	Spellbinder	Planetoid	Repton 3 passwords

## Volume 3

Repton Tiny Time	Angry Zone	Soldier 40	Sphere of Destiny
Shark	Frankenstein 2000	Ziggy	30 Doty
Barbarian	Psycofina	The Big KO	Meteors
Skirmish	Round Ones	Omega One	Thunderstruck
Breakthrough	Overdrive	Future Shock	Creepy Cave

TO ORDER PLEASE USE THE FORM ON PAGE 51



**This John Geraghty utility will help cut down on the typing toil when entering those long listings**

# Keyboard short cuts

**E**LECTRON users have a tremendous advantage over BBC Micro owners when it comes to typing in programs, whether they are your own home grown efforts or magazine listings, thanks to the Electron's single keypress Basic keyword entry system.

Hold down the Func key, tap a letter and up pops a Basic command on screen just as if you had typed in the whole word. It makes entering listings that much easier and quicker than typing everything in letter by letter.

However, what it can't do is speed up entry of the non-Basic words like commonly used variables, or even frequently used strings. This is where EZ-Type comes in. It enables you to define any word or string and call it up with the minimum number of key presses.

To use it, enter and save the listing. Run the program to assemble the machine code and store it in memory. CALL &B00 to activate the utility. Now type NEW as you don't need the Basic listing any longer.

You can ask EZ-Type to store strings of characters, such as variables, in memory by typing a plus sign followed by the string like:

```
+"LENGTH"
+"width"
+"PRINT TAB"
```

If all is well you'll see the message OK on the screen. If you change your mind you can delete a string or variable by preceeding it with a minus sign like:

```
-"width"
```

To enter the variable *LENGTH* simply type L and press Shift+spacebar and the rest of the word will appear. Similarly, *width* is typed by pressing W followed by Shift+spacebar, and *PRINT TAB* by P followed by Shift+spacebar.

As you can see, you just type the first letter of the string or variable and hit



Shift+spacebar to fill in the rest of the letters. Once the word is printed you carry on typing as usual. It's just like using the Func key Basic keyword expansions.

One problem that may have occurred to you is what will happen if two or more variables or strings start with the same letter. In this case the first one found by the utility is the one that will be printed.

However, if you keep pressing Shift+spacebar the next one starting with that letter will be printed, then the next and so on. Eventually there will be no more, so the first one will be printed again, then the second and so on. So the solution is to keep pressing Shift+spacebar until the right variable or

string is displayed.

Several problems can occur and these are highlighted by error messages. You are limited to strings 16 characters long and if you try to define one that is longer a *String too long* message comes up.

If the string doesn't start with a letter you'll get *Syntax error*. There is a limit to the number of strings that can be stored and if too many are defined you'll get *No room*. If you try to delete a string and the program can't find it a question mark will be displayed.

When you have finished with the utility press the Break key to clear the memory - but don't forget to save the program you have been typing in first.

```
10 REM EZ-Type Source
20 REM By John Geraghty
30 REM (c) Electron User
40 MODE6
50 PROCassemble
60 PRINT""Press <RET> to save
EZTYPE"
70 REPEAT UNTIL GET=13
80 *SAVE EZ B00 000
90 CALL intercept
100 END
110 :
120 DEF PROCassemble
130 topv=&70
140 stringv=&72
150 temp=&74
160 letter=&76
170 flag=&77
180 len=&78
190 acc=&79
200 brkv=&202
210 insv=&22A
```

```
220 input=&700
230 pointers=&880-2*ASC"A"
240 basic=&8AF3
250 err1=&8CB7
260 err2=&9C03
270 osasc=&FFE3
280 osbyte=&FFF4
290 :
300 FOR pass=0 TO 2 STEP2
310 PX=&B00
320 COPT pass
330 .intercept
340 \topv will point to top of
list
350 LDA #&09
360 STA topv+1
370 LDA #0
380 STA topv
390 STA letter
400 :
410 \&880 to &8F3 reserved for
set of 2-byte pointers, one per l
```

```
etter
420 LDX #&F3
430 .clear
440 STA &800,X
450 DEX
460 BMI clear
470 :
480 \brk_trap manipulates Linke
d list, ins_trap inserts appropri
ate string into keybuff
490 .trap_vectors
500 SEI
510 LDX #brk_trap MOD&100
520 LDY #brk_trap DIV&100
530 STX brkv
540 STY brkv+1
550 LDX #ins_trap MOD&100
560 LDY #ins_trap DIV&100
570 STX insv
580 STY insv+1
590 CLI
```

Turn to Page 33 ►



# Here's how you can get the very best out of your Electron

Within the pages of these three books you'll find ALL the information you need to fully harness the power of your Electron. They cover Basic, machine-code programming and the operating system, and between them they also show how to combine all three to create more powerful and effective programs.

For the give away price of just £7.95 for the three, these books represent exceptional value and are a must for any serious Electron user.

## Electron Advanced User Guide

This detailed guide to the Electron's operating system is packed full of invaluable information. It shows you how to:

- Implement the powerful \*FX/OSBYTE calls
  - Write your own paged roms
  - Program the ULA
  - Make every byte count where program space is tight
  - Use the Electron's exciting capabilities to the full by following the complete circuit diagram
- ...and much, much more.

This essential handbook will help you to exploit the full potential of your Electron. And for just £2.95, saving £6.50 off the recommended price, can you afford not to miss this offer?

## Electron Assembly Language

The Electron Assembly Language reference guide will help you get to grips with machine code in next to no time. Whether you're a beginner or are already fairly proficient, there is something for you in this book.

It has over 200 pages packed with hints, tips and example programs on subjects ranging from basic hex, binary and decimal number theory and logical operators, through addressing modes, stacks and loops, to subroutines, jumps and calls.

Every aspect of machine-code programming is covered in this book in a friendly, readable style, and there's also a comprehensive index. If you want to get more out of your micro, but thought machine code was indecipherable, this is the book for you. *Save £3 off the recommended retail price.*

## Getting started in BBC Basic on the BBC Micro & Electron

This is the ultimate guide available on BBC Basic. Written by a leading expert on the language, it will lead you through each Basic function in a simple, easy-to-follow style.

Whether you are a beginner or more advanced, there are examples of commonly-needed routines and neat tricks you can use to make Basic jump through hoops.

By working through its many examples you will gain a clear insight into structured programming and will quickly acquire the ability to use structured techniques in creating your own programs. *Save £3 off the recommended retail price.*

**Only  
£7.95 for all three**

**SAVE  
£12.50**



**TO ORDER PLEASE USE THE FORM ON PAGE 51**



# From Page 31

```

600 RTS
610 :
620 .brk_trap
630 PHP
640 PHA
650 TXA
660 PHA
670 TYA
680 PHA
690 \check if syntax error
700 LDY #0
710 LDA (&FD),Y
720 CMP #810
730 BEQ list_chk
740 .out
750 PLA
760 TAY
770 PLA
780 TAX
790 PLA
800 PLP
810 JMP !brkv AND &FFFF
820 :
830 .list_chk
840 \check for LIST$
850 LDA input,Y
860 CMP #8C9
870 BNE plus_chk
880 INY
890 LDA input,Y
900 CMP #ASC"3"
910 BNE out
920 :
930 LDX #ASC"A"-1
940 .next_list
950 INX
960 CPX #ASC"z"+1
970 BEQ done
980 CPX #ASC"i"+1
990 BNE caps
1000 LDX #ASC"e"
1010 .caps
1020 TXA
1030 JSR start_addr
1040 :
1050 \stringv contains pointer to
a start of list for letter
1060 .next_string
1070 JSR inc_sv
1080 BEQ next_list
1090 \stringv contains address of
1st string on list; 1st char not
stored, therefore...
1100 TXA
1110 JSR osasc
1120 :
1130 INY
1140 .print_string
1150 INY
1160 LDA (stringv),Y
1170 JSR osasc
1180 CMP #80B
1190 BNE print_string
1200 BEQ next_string
1210 .done
1220 JMP basic
1230 :
1240 .plus_chk
1250 CMP #ASC"++"
1260 BNE minus_chk
1270 \check syntax and length
1280 JSR string_chk
1290 BCS out
1300 \move from input to top of
list
1310 JSR transfer
1320 TXA
1330 JSR start_addr
1340 :
1350 \get address of last item in
list
1360 .ploop
1370 JSR inc_sv
1380 BNE ploop
1390 :
1400 \put address of new item (a

```

```

t top of list) into link of last
item
1410 LDY #0
1420 LDA topv
1430 STA (stringv),Y
1440 INY
1450 LDA topv+1
1460 STA (stringv),Y
1470 :
1480 \reset topv to new top
1490 LDA len
1500 CLC
1510 ABC topv
1520 STA topv
1530 BCC lout
1540 INC topv+1
1550 .lout
1560 JMP ok
1570 :
1580 .minus_chk
1590 CMP #ASC"--"
1600 BEQ minus_chk2
1610 JMP out
1620 .minus_chk2
1630 JSR string_chk
1640 BCS out
1650 TXA
1660 JSR start_addr
1670 :
1680 \move along links looking for
or match between string in input
and string in list
1690 .minus_loop
1700 LDA stringv
1710 STA temp
1720 LDA stringv+1
1730 STA temp+1
1740 JSR inc_sv
1750 \Z set means no more items
1760 BEQ not_found
1770 LDY #2
1780 .mloop
1790 LDA (stringv),Y
1800 CMP input+1,Y
1810 BNE not_yet
1820 CMP #80D
1830 BEQ match_found
1840 INY
1850 BNE mloop
1860 .not_yet
1870 JMP minus_loop
1880 :
1890 .match_found
1900 \temp holds address of string
before matching string; put link
address of latter into former
1910 LDY #0
1920 LDA (stringv),Y
1930 STA (temp),Y
1940 INY
1950 LDA (stringv),Y
1960 STA (temp),Y
1970 .ok
1980 BRK
1990 EQU 99
2000 EQU "OK"
2010 BRK
2020 :
2030 .not_found
2040 BRK
2050 EQU 99
2060 EQU "?"
2070 BRK
2080 :
2090 .string_chk
2100 \check for opening quote
2110 INY
2120 LDA input,Y
2130 CMP #822
2140 BNE bad_syntax
2150 INY
2160 LDA input,Y
2170 TAX
2180 \check for letter
2190 JSR alph_chk
2200 BCS bad_syntax
2210 .sloop
2220 INY
2230 LDA input,Y

```

```

2240 CMP #822
2250 BEQ len_chk
2260 CMP #80D
2270 BNE sloop
2280 .bad_syntax
2290 \flag fail condition
2300 SEC
2310 RTS
2320 :
2330 .len_chk
2340 CPY #813
2350 BCS too_long
2360 LDA #80B
2370 STA input,Y
2380 CLC
2390 RTS
2400 .too_long
2410 JMP err2
2420 :
2430 .alph_chk
2440 ORA #82D
2450 CMP #ASC"a"
2460 BCC fail
2470 CMP #ASC"z"+1
2480 RTS
2490 .fail
2500 SEC
2510 RTS
2520 :
2530 .transfer
2540 \enough memory?
2550 TYA
2560 ABC topv
2570 LDA topv+1
2580 ABC #0
2590 CMP #80B
2600 BNE memory_ok
2610 \Rom error message
2620 JMP err1
2630 :
2640 .memory_ok
2650 \reserve two bytes for pointer
to next item in linked list
2660 LDA #0
2670 STA input+1
2680 STA input+2
2690 TAY
2700 .tloop
2710 LDA input+1,Y
2720 STA (topv),Y
2730 INY
2740 CMP #80D
2750 BNE tloop
2760 STY len
2770 RTS
2780 :
2790 .start_addr
2800 ASL A
2810 CLC
2820 ABC #pointers MOD8100
2830 STA stringv
2840 LDA #pointers DIV8100
2850 ABC #0
2860 STA stringv+1
2870 RTS
2880 :
2890 .inc_sv
2900 LDY #1
2910 LDA (stringv),Y
2920 BEQ isend
2930 PHA
2940 DEY
2950 LDA (stringv),Y
2960 STA stringv
2970 PLA
2980 STA stringv+1
2990 .isend
3000 RTS
3010 :
3020 .ins_trap
3030 PHP
3040 STA acc
3050 TXA
3060 BNE not_key
3070 PHA
3080 TYA

```

Turn to Page 36 ►



# Spring Along. . .

## LATEST TITLES

Repton thru Time .....	£5.25
Barbarian .....	£6.75
Saigon .....	£7.00
Play it again Sam II .....	£6.75
Play it again Sam III .....	£6.75
Shark .....	£7.00
Summer Olympiad .....	£6.75
Breakthrough .....	£7.50



## TRIPLE DECKERS

### 3 Games on 1 Cassette for £1.99

1. Grand Prix/Day at the Races/Manic Mole
2. Invasion Force/Haunted/Parachute
3. Lunar Invasion/Lander/Jam Butty
4. Howzat/Fishing/Golf
5. Starfight/Skramble/Karate Warrior
6. Cavern Capers/Snap Dragon/Castle of Sand
7. Atom Smash/Knock Out/Reaction Tester
8. Greblt/Mr. Freeze /Fruit Worm
9. Break Free/Missile Jammer/Code Breaker
10. Rockfall/Bunny Blitz/ Money Maze

## ACORNSOFT TITLES

Talkback .....	£1.50
Workshop .....	£1.50
Sphinx Adventure .....	£1.00
Starship Command .....	£1.00
Chess .....	£1.00
Desk Diary .....	£1.00
Business Games .....	£1.00
Boxer .....	£1.00
Me and My Micro .....	£1.00
Snapper .....	£1.00
Complete Cocktail Maker .....	£1.00
Watch Your Weight .....	£1.00
Linkword Italian .....	£2.25
Linkword Spanish .....	£2.25
Turtle Graphics .....	£2.25
Advanced User Guide .....	£3.25
Lisp .....	£1.99

## BUDGET TITLES

Stix .....	£1.99
Ravage .....	£1.99
Diamond Mine .....	£1.99
Joey .....	£1.99
Pengwyn .....	£1.99
Xanagrams .....	£1.99
Joe Blade I .....	£1.99
Joe Blade II .....	£1.99
Mini Office .....	£4.95
Dog Fight .....	£2.99
Warehouse .....	£2.99
Cascade (50 Games) .....	£2.99
Daredevil Dennis .....	£1.99
Snooker (Steve Davis) .....	£1.99
Tarzan (MarTech) .....	£2.99
Football Manager .....	£2.99
Microvalue 1 .....	£3.99
Microvalue 2 .....	£3.99
Microvalue 3 .....	£3.99
Grid Iron .....	£1.99
Graham Gooch Cricket .....	£1.99

## CURRENT TITLES

Elite .....	£9.95
Bonecruncher .....	£7.50
Last of the Free .....	£3.99
Acomsoft Hits 1 .....	£3.99
Acomsoft Hits 2 .....	£3.99
Five Star Games Vol 3 .....	£7.50
10 Computer Hits Vol 4 .....	£7.50
Life of Repton .....	£5.50
Omega Orb .....	£6.25
Dispatch Rider .....	£6.95
Ransack .....	£7.50
Ziggy .....	£6.95
Impact .....	£7.50
Play it again Sam .....	£7.50
Colossus 4 Chess .....	£7.50
Superior Hits Vol 3 .....	£7.50
Around World 40 Screens .....	£5.50
The Lost Crystal .....	£9.95
The Hunt .....	£7.50
Village of Lost Souls .....	£7.50
Spy v Spy .....	£7.50
Five Star Games Vol 1 .....	£7.50
Five Star Games Vol 2 .....	£7.50
10 Computer Hits Vol 2 .....	£7.50
10 Computer Hits Vol 3 .....	£7.50
Winter Olympiad '88 .....	£7.50
Star Wars .....	£7.50
Spycat .....	£7.50
Boulderdash .....	£7.50
Indoor Sports .....	£7.50
Phantom Combat .....	£2.99
Repton II .....	£2.99
Karate Combat .....	£2.99

## EPIC ADVENTURES

Wheel of Fortune .....	£4.95
Castle Frankenstein .....	£4.95
Quest of the Holy Grail .....	£4.95
Kingdom of Klein .....	£4.95

## ROM CARTRIDGES

Viewsheet .....	£11.95
View .....	£11.95
Logo .....	£28.50

## BACK IN STOCK

Monsters (Acomsoft) .....	£2.50
Arcadians (Acomsoft) .....	£2.50

NEW

## RELEASES FOR 1989

NEW

Ninja .....	£6.75
Question of Sport .....	£9.25
Commando .....	£2.99
Indoor Soccer .....	£1.99
Play it again Sam V .....	£6.75
Repton Infinity .....	£9.25
Exile Superior .....	£9.25
Play It again Sam IV Sup. ....	£6.75
Pipeline Sup. ....	£6.75
Fair Means or Foul Sup. ....	£6.75
Play It again Sam VII .....	£6.75
Circus Games .....	£6.75
Superman .....	£6.75



## TOWERHILL

Unit 7, Acacia Close, Cherry Court Way Ind. Est.  
Leighton Buzzard, Beds.

Telephone: Leighton Buzzard (0525) 385329/383074





# With Our Bargain Prices

## Me and My Micro

Learn how to start writing programs for your computer.  
Inc Free Book

**£1.00**

## Complete Cocktail Maker

Have the ability to concoct over 300 different drinks to suit every mood and taste

**£1.00**

## COLOSSUS BRIDGE

Allows one player to play Bridge with the computer, Blackwood, Stayman & Baron conversions

**£8.50**

## FIRST STEPS WITH MR. MEN

Simple and absorbing games (4-8 yrs) for early learners when starting to read

**£4.99**

## HERE AND THERE WITH MR. MEN

These games (4-8 yrs) are designed to teach children about giving directions and plan simple routes.

**£4.99**

## Watch Your Weight

A weight loss program which will choose an appropriate diet to fit all individuals - Inc Calorie Counter

**£1.00**

## Boxer

Catch Balloons whilst avoiding flying weights, boxing gloves and hurtling dumbbells

**£1.00**

## STRIKE FORCE HARRIER

Bomb the enemy HQ whilst defending yourself from enemy aircraft and ground forces - Great Game

**£3.99**

## POWER PACK 1

7 Great Games

Includes:  
Zelda, Ultron, Wizzys Mansion, Wongo, Bugeyes 2, Space Ranger, Caveman Capers

**£4.50**

## Desk Diary

A central filing system which copes with all office requirements, also acts as an address book

**£1.00**

## Turtle Graphics

Teaches Geometry, Mathematics and graphics at elementary level

**£2.25**

## ATLANTIS

League Challenge	£2.99
Survivors	£2.99
Panic	£1.99
Cops and Robbers	£1.99
Creepy Cave	£1.99
Pro Golf	£2.99
Frankenstein 2000	£1.99
Golden Figurine	£1.99

NEW

## FROM ATLANTIS STORM CYCLE

**£1.99**

NEW

## PLAY IT AGAIN SAM 8

Contains: Mr. Wiz, Quest, Winter Olympiad, Repton 40 screens

**£7.00**

## POWER PACK 2

Another 7 Great Games

Includes:  
Psycastris, Thunderstruck, Stix, Saracoid, Last of the Free, Froot Raid, Drain Mania

**£4.50**

## SUPERIOR at £1.99 each

Fruit Machine  
Invaders  
Draughts  
Reversi  
Stranded  
Mr. Wiz  
Chess  
Smash 'n' Grab

Percy Penguin  
Alien Dropout  
World Geography  
Centi Bug  
Overdrive  
Tempest  
Death Star  
Repton I (£2.99)

## Twin Rom Cartridge Holders

**£9.95**

## Electron Power Supply Unit

**£9.95**

## BRIAN CLOUGH FOOTBALL FORTUNES

with Board Game  
**£4.99**

NEW

## BARBARIAN II (Mid March)

**£6.75**

NEW



**ALL PRICES INCLUDE V.A.T. AND P&P  
OVERSEAS ORDERS ADD £1.00**





# ◀ From Page 33

```

3090 PHA
3100 LDA acc
3110 CMP #ASC" "
3120 BEQ shift_chk
3130 :
3140 LDX #0
3150 STA letter
3160 JSR alph_chk
3170 BCC set_flag
3180 \not in alphabet, so store
zero
3190 .not_letter
3200 STX letter
3210 .set_flag
3220 STX flag
3230 .insv_out
3240 PLA
3250 TAY
3260 PLA
3270 .not_key
3280 TAX
3290 LDA acc
3300 PLP
3310 JMP !insv AND 8FFFF
3320 :
3330 .shift_chk
3340 LDY #8FF
3350 LDX #0
3360 LDA #8CA
3370 JSR osbyte
3380 TXA
3390 AND #840
3400 TAX
3410 BEQ not_letter
3420 :

```

```

3430 \shift+spacebar are pressed
; was previous char a letter?
3440 LDA letter
3450 BEQ set_flag
3460 :
3470 \if flag<0 means you're at
epping through the linked list
3480 LDX flag
3490 BNE address_ok
3500 :
3510 \get start address of list
for that letter...
3520 LDA letter
3530 JSR start_addr
3540 JSR inc_sv
3550 \Z set means no strings
3560 BEQ not_letter
3570 :
3580 .address_ok
3590 \de_intercept
3600 LDX #?insv
3610 LDY #?(insv+1)
3620 SEI
3630 STX insv
3640 STY insv+1
3650 CLI
3660 LDX flag
3670 \nothing to delete first ti
me
3680 BEQ insert
3690 :
3700 LDA #88A
3710 .delete
3720 DEC len
3730 BMI insert
3740 LDY #87F
3750 LDX #0

```

```

3760 JSR osbyte
3770 JMP delete
3780 :
3790 .insert
3800 LDY #2
3810 STY flag
3820 .iloop
3830 LDA (stringv),Y
3840 CMP #8DB
3850 BEQ end
3860 STY temp
3870 TAY
3880 LDA #88A
3890 LDX #0
3900 JSR osbyte
3910 LDY temp
3920 INY
3930 BNE iloop
3940 .end
3950 DEY
3960 DEY
3970 STY len
3980 :
3990 \if last string inserted, r
eturn to start of list
4000 JSR inc_sv
4010 BNE retrap
4020 LDA letter
4030 JSR start_addr
4040 JSR inc_sv
4050 .retrap
4060 JSR trap_vectors
4070 \throw away space
4080 LDY #0
4090 STY acc
4100 JMP insv_out
4110 J: NEXT: ENDPROC

```

**LAST CHANCE!** to add second processor power to your Electron with E2P 65 cot. 3 x speed increase, extra 64k RAM, only a few left. Price £79 inc VAT and UK postage. Please state ROM, 3.5" disc, 5.25" disc, or tape for E2P operating system + Hi Basic.

Also a few Electron Wordwise Plus, requires E2P, price £29.95 inc VAT and UK postage.

Write or phone for more information.

## Near Text Quality Typsetting Software

## **NEW** ELECTRON VERSION

"Quite simply the best font software available for the BBC" – NTQ users say it – the reviewers agree –

If you want to produce quality worksheets, newsletters, OHP slides, menus, leaflets, concert programmes and tickets, exam papers, reports, invoices or just add style to your personal letters – NTQ's for you.

Use NTQ with VIEW, WORDWISE, WORDPOWER or BASIC with ANY EPSON compatible printer (MX and FX).

FONT LIBRARY CONTAINS OVER 40 HIGH QUALITY FONTS – standard typefaces + foreign languages + maths/science symbols + fancy styles.

Write or phone for leaflet, full list of fonts and sample printout.

MIX FONTS, HEIGHTS WIDTHS AND PITCHES IN ONE LINE OF TEXT – just like this:

**MULTI-HEIGHT  
MULTI-FONT**

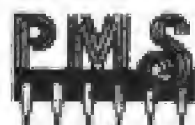
**MULTI-WIDTH  
MULTI-PITCH**

**BACKGROUNDS**

**INVERSE**

ÀÓÀÆÇèàòòùöle

α±÷×√≡≠~≈ζ♪



**Permanent Memory Systems**  
38 MOUNT CAMERON DRIVE  
EAST KILBRIDE G74 2ES  
SCOTLAND

03552-32796 (24 Hour)



## JOYSTICKS



### DELTA 38 SINGLE JOYSTICK FOR ELECTRON WITH PLUS 1

£14.95

A single joystick that in some ways can act as two. The custom made special 'low noise' potentiometers are wired so that it will work as a left hand or right hand joystick. It can even run some programs written for two joysticks and has the fire buttons of both.

### DELTA 36 TWIN JOYSTICK FOR ELECTRON WITH PLUS 1

£21.95

A direct but improved alternative for the original ACORN joysticks, with 2 joysticks wired to one plug. As with all our joysticks they have the fast action sprung to centre return of the steel shafted nylon covered joystick. The light action makes them ideal to hold and the 3 fire buttons allow left or right-handed use.

### DELTA 35 SINGLE-JOYSTICK TO FIT SWITCHED JOYSTICK INTERFACE

£14.95

JOYSTICK INTERFACE

£19.95

### DELTA 35 + JOYSTICK INTERFACE TOGETHER

£29.95

### **SPECIAL OFFER**

Slimline, Grey Fronted, Uncased, 3.5" DS-80T Disc Drives  
£65

5 Volt Power Packs (modified video game power supplies) suitable for above drives  
BARGAIN AT £9.95



Prices are inclusive of Carriage and VAT  
Money back Guarantee if not satisfied



**Voltmace**

Unit 9 (Dept. EU)  
Bander Business Centre  
London Road  
Baldock  
Herts SG7 6HP  
Telephone: (0462) 894410



**M**ODE 7 has always been an Electron owner's dream. When the micro first appeared many people, including most reviewers, complained about the fact that it wasn't in the specification. The missing mode allows the creation of attractive screen displays in only 1k of memory, so most BBC Micro programs use it whenever possible to display text. The generally makes the programs incompatible with the Electron.

Without Mode 7 Electron owners can't create their own displays or see BBC Micro programs in their true colours. The only solution until now has been to buy the Jafa Systems Mode 7 adaptor. Unfortunately, its price placed it beyond the reach of some owners.

Now, however, Jafa has released a Mode 7 simulator rom very reasonably priced at £25.

Owing to their nature, software simulations can never be as good as their hardware counterparts. Although this simulation isn't as good as the original adaptor it performs extremely well. The software works by simulating a Mode 7 screen in Mode 2 – which leads to some problems, but more of them later.

The rom comes with an 18 page manual, screen designer software on either 3.5in disc or cassette, manual and a sheet noting differences between the Electron and BBC Micro versions of the screen designer software.

With the rom installed and the machine in Mode 7 typing \*HELP MODE 7 brings up a nicely coloured screen which gives a short description of each command in the simulator and also tells you which function key and screen update mode you are in.

Type \*MODE7ON to switch on the rom and a Mode 7 startup screen then appears; it is very similar to the normal startup display.

If you type \*HELP BARS coloured bars from

‘The characters are pretty good, even if they seem a little square’

black through the palette to white are displayed to allow you to set the brightness and contrast on your TV. After this Mode 7 is then ready for use although you can switch between it and other modes using Basic's standard MODE command.

The characters are pretty good, even if they seem a little square. As the simulation is in Mode 2 the teletext character set has gone,

but the new one is a pleasant change.

Both upper and lower case letters are good, but capital N and both versions of W and M look a little strange. Symbols suffer most, with characters such as the ampersand, hash and dollar taking a bit of getting used to.

Reason for the characters' strange appearance is that two have to squeeze into the space normally occupied by one Mode 2 character. In Mode 7 the screen is 40 by 25,

# The software solution

**Stephen Cusack adds a Mode 7 simulator to his Electron and finds it compares well with the real thing**

with each character 10 pixels high, while Mode 2 is 20 by 32, with each character eight pixels high. This means that each simulated Mode 7 character is only four Mode 2 pixels wide, with one being used for spacing, thus limiting the resolution.

The worst problem with the simulator is scrolling, which is extremely slow, even with a Slogger Master Ram Board. As hardware scrolling is impossible the complete Mode 2 screen has to be moved in memory.

During scrolling the machine switches to Mode 6, where the Electron is fastest, to speed up the process. It makes scrolling quite painful to watch, with the screen first blanked then displaying the scrolled display. Very offputting, especially in BBC Micro adventures which run under the simulator if you have a 64k machine.

If you are scrolling a listing, for instance, holding down Control will show just one line on the screen so you can see where you are. When you are at the required place you release the button and the rest of the screen will fill in.

The screen is quite cleverly stored in memory. For the simulator to be able to respond correctly to Mode 7 screen pokes the original display area is still at &7C00 to &7FEB. The Mode 2 screen memory is between &2800 and &7800. The Mode 7 store is read and

then transferred to the Mode 2 area for display.

Two rates of transfer can be chosen, \*MNORMAL and \*MRAP. The first takes about five seconds for data to transfer, while the rapid one zaps it over in about 1.5 seconds. This is why Mode 7 screens take time to build up although they are almost instantaneous on a BBC Micro. If you have a Master Ram Board then the rapid rate is selected by default; without one, if you select \*MRAP keyboard response is delayed.

Control of function keys is not altered. Keys under the numbers (Q-P) when held down with Func correspond to Shift+Control+f0 to Shift+Control+f9. Those with Func (ASDF...) are the same as pressing Control and a function key. Those on the bottom row are the same as pressing Shift and a function key.

The only problem here is that it halts the operation of the Electron's one-touch Basic keyword entry system. This can be cured by typing \*EFN, which restores the Electron's keywords and disables the above effect. \*BFN

switches it back again.

All the teletext control codes are supported. Unfortunately the manual assumes that you have had previous Mode 7 experience, as it offers only a very limited summary of the codes. Chapter 28 of the BBC Micro User Guide gives the necessary information.

If you type \*MCOMM when in Mode 7 you are put into the Prestel terminal which is supplied on the same rom. As far as the Electron goes this is a relatively unexplored field.

Another useful command included is \*TV which allows the screen display to be moved up or down – a great boon for TV owners.

The screen editor software provided is flexible and easy to use, but owing to the fact that it is a converted BBC Micro program it

‘Mode 7 screens take time to build up although they're almost instantaneous on a BBC Micro’

only works if you have a 64k Electron. Screens are designed as pages with eight pages making up a book. Books can then be cycled, looked at or strung in a long line with other disc-bound books to provide a memo or information board. An obvious use for this is in

Turn to Page 38 ▶



◀ From Page 37

an educational environment.

The software is 3.5in disc only. If you have DFS and a 5.25in disc drive the software is supplied on cassette with a tape-to-disc conversion on the cassette.

The accompanying manual is excellent. It is easy to read and explains clearly how everything works. It even has sections telling you how to use Wordwise and the ATS (tel-text adapter) rom with the simulator.

Wordwise is perhaps the best selling BBC Micro word processor and is great to use. The manual was written on an Electron with Wordwise – as was this review. Again, it is best used with a 64k Electron, as very little memory is left free on a normal Electron.

## Conclusion

Although some characters may look a little strange and the scrolling is not too impressive this is a quite remarkable piece of software. It performs well at a reasonably low price. Master Ram Board owners will benefit most as this gives them 1k more free memory than the BBC Micro has in Mode 7. It also allows you to use the editor software and applications such as Wordwise.

Although it is still very useful on a normal Electron, there is only about 6k free (ADFS or DFS) compared to 28k on a 64k Electron. Most BBC Micro Mode 7-dependant software that can fit into the free space – which is most of

them if the Electron has a Master Ram Board – should operate normally, albeit more slowly than they would on a BBC Micro.

As it has both communications and screen editor software this package is very hard to fault. Most of the better BBC Micro Mode 7 software, even on rom, worked on my 64k machine. This therefore means an increased level of BBC Micro/Electron compatibility, which is indeed very welcome.

My advice to any Electron owner who has

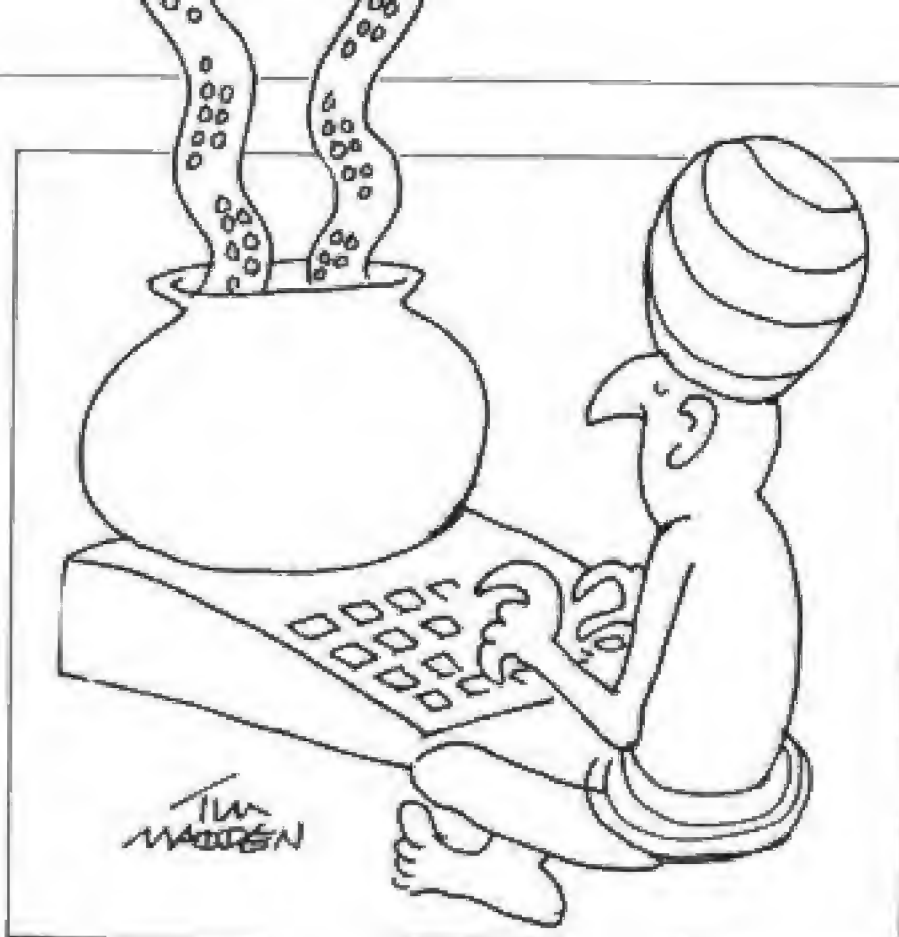
always envied Mode 7, or even the casual user, is to buy it. Although it is at its best on a 64k machine it can still be used to great effect on a normal one. This is truly Electron Mode 7 for all.

*Product: Mode 7 Simulator*

*Price: £25*

*Supplier: Jafe Systems, 9 Lon-Y-Garwa, Caerphilly, Mid-Glamorgan CF8 1NL*

*Tel: 0222 897203*



# TWO WAYS TO ENSURE YOU GET electron user EVERY MONTH

1. Complete and mail subscription form on Page 51
2. Hand this form to your newsagent.

Please reserve me a copy of Electron User magazine every month until further notice.

- ☐ I will collect  
☐ I would like it delivered to my home.

Name \_\_\_\_\_

Address \_\_\_\_\_

*Note to newsagent: Electron User should be obtainable from your local wholesaler, or contact Circulation Manager on 0424 430422*



Whatever your subject...

French, First Aid, Football, Spelling, Science, Spanish, Sport, Scotland, England, English Words, German, General Knowledge, Geography, Italian, Arithmetic, Natural History.

## Let your computer help you learn

Write or phone for a FREE 20 page illustrated catalogue of our Leisure and Educational Software

**KOSMOS SOFTWARE LIMITED**

**FREEPOST (no stamp needed)**

**DUNSTABLE, Beds. LU5 6BR**

**Tel: 05255 3942 or 5406**

## ELECTRON LIGHT PEN

- ✓ Connects to the User Port (any make)
- ✓ Works in all modes – character resolution
- ✓ Comes with documented procedure to add to your own programs and FREE 'PenPaint' software (Icon driven) Tape or 40/80 track 5.25 DFS Disc
- ✓ Comprehensive instructions
- ✓ Now with On-Barrel Touch Switch

Cheques, PO's for £29.94 all incl. (UK) to:

**N. Fotios  
Rose Villa West  
Bentinck Road  
Elswick NE4 6UX**



**T**HERE are several basic laws that govern the universe and one of them is that a computer will never have enough memory. The first computer I made had 256 bytes – not kilobytes, just bytes. At that time I remember saying that 4k was enough memory for anyone.

But by today's standards the Electron is not overly blessed with memory, so I would like to look at the problem of sorting large data files and see how to squeeze a quart into a pint pot.

The problem is that to sort a file efficiently you have to have the whole of that file in memory at the same time. True, you can do sorts with random access files, but that involves a lot of disc access and can be very slow.

It is perfectly possible to have files much larger than the amount of memory you have available. However, sorting a file of such a size can be a problem. I am not going to give you a sample program to do this, as virtually every application involves a different set of constraints. What I want to do is to show you how to go about writing such a program.

A technique of sorting large files was developed for mainframe computers many years ago, but I have never seen any mention of it in micro circles. It's known as a tournament sort, and is quite easy to follow.

Let's call the file we want to sort FRED and suppose it's too large to fit completely into memory at any one time. So we make temporary files or "sons" of FRED, each one able to fit completely into memory as shown below. We must make the number of sons of FRED a

# Tournament for big files

**Mike Cook applies a mainframe technique to a micro problem**

power of two, in other words two, four, eight or however many we need.

The sons are simply a part of the whole, so if we are creating four sons each file will have a quarter of the original records in it. Once these are created the original file FRED can be deleted to save disc space.

Then each son of FRED is placed wholly into memory, sorted with whatever technique you like and written back to disc, giving us four sorted sons, which are our candidates for the tournament.

Reading the first record of each file, we fill the first four buffers, which we'll call semi-finals – a buffer is simply a variable or set of variables in your program representing the data record you want to sort.

We compare two of them, take the smaller – or larger if we are sorting in descending order – and place it into the final buffer. We

then do the same for the other two so that both final buffers are full. The winning record from each semi-final buffer is replaced from the appropriate son of FRED file.

Now on to the final. Take the smallest entry in the buffer and write it out to a new file called Sorted FRED. Replace the missing finalist from the appropriate semi-final and replace the successful semi-finalist, again from the appropriate son of FRED file.

You can see that if you continue this until all the sons of FRED files are empty you will have sorted the whole file.

Remember that some sons will run out of data before others. When this happens you must pad the buffers with dummy data which will be lost in any tournament. As soon as all buffers contain dummy data your sort is at an end. You can now delete all the sons of FRED files and rename your sorted file FRED.

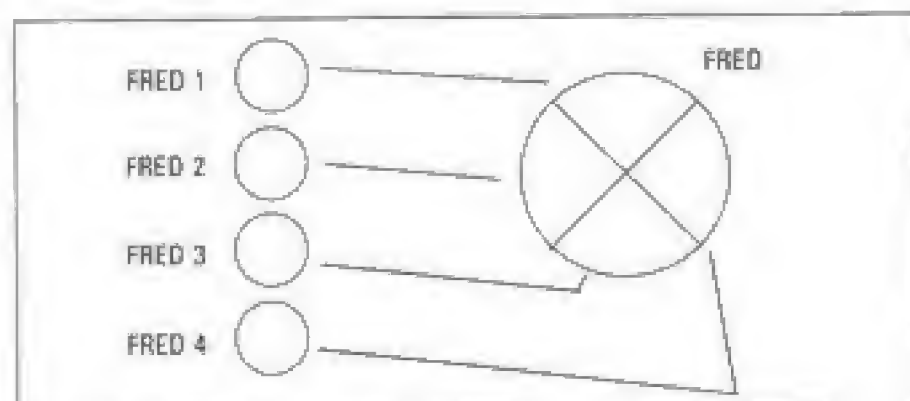
This technique can cope with any size of large file, as each stage buffer only represents one record, and so will not take up much space.

I think you can see how this can be easily extended to using eight sons of FRED by incorporating a quarter-final stage in your tournament. To cope with really large files, the sons may even be on different discs.

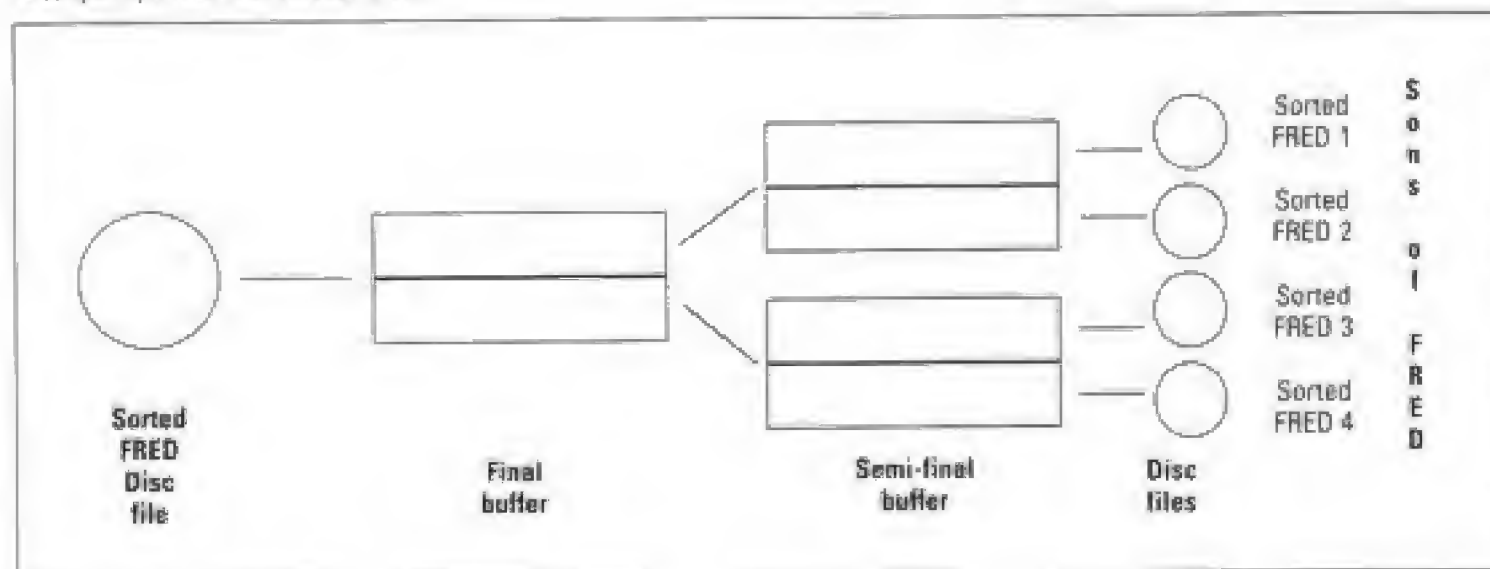
If you delete the original FRED file before writing the sorted FRED you will avoid the dreaded *can't extend* error message, as the two files will be exactly the same length.

However, when adding records to FRED make sure that it is the last file on the disc – the last thing you saved – so the DFS can extend it.

There you have it . . . you can now sort files as large as you like.



First split up FRED into smaller files



Then let the tournament begin



# NEW! TEN of the BEST! EDUCATIONAL GAMES

Packed full of some of the best educational games from the pages of *Electron User*, the new Ten of the Best Educational Games is the ideal way for your children to learn about maths, spelling, anagrams, telling the time, general knowledge, and even the rudiments of running a business!

Specially compiled by the *Electron User* team to give a good grounding in all aspects of learning, and at the very special price of only £5.95 on tape, or £6.95 on 3.5in disc, this collection is a treat you and your children cannot afford to miss!

*Give your children hours of fun, and help them to learn the easy way by ordering your copy today.*

## THE PROGRAMS

**Company Count** – Work your way up through the company starting off as a messenger, and ending up as president!

**Hungry Harry** – Find out what it's like to be an assistant in a busy shop. Can you work out the correct change to give the customers?

**Lemonade Stall** – Try your hand at running a lemonade stall at a popular seaside resort.

**Dozer Disorder** – Fill in the

missing letters after they are bulldozed into a pit.

**Crocodile** – Unscramble the letters of a word before the crocodile gets you.

**Snail Trail** – See how good you are at general knowledge in this trivia quiz.

**Hiss** – Improve your spelling by guiding a snake round the garden eating up words in the right letter order.

**Maths Fun** – Test your powers of mental arithmetic.

**Odd One Out** – Pick the object that doesn't fit from the list of five.

**Yule Spell** – Guess the hidden word or you'll lose your Christmas presents!

**ONLY £5.95**

Order your copy today, using the form on Page 50





TEL: 0276 72046  
FAX: 0276 51427

Now available through PRES **Advanced Computer Products** range of software products

### ADVANCED CONTROL PANEL

(20) /M/B/E/C £30 ex VAT £34.50 inc VAT  
ACP is a front end control panel language providing a sophisticated yet friendly interface between user and computer for access to Languages, MOS functions and the users own file utility etc. Main features include pull down windows, simple to change MOS configure, floating point calculator, file manager, SW ROM's facilities:

(16K EPROM & FULL MANUAL)

"It's very easy to create an entire customised front end for your own use." - *Acorn User, August 1987.*

"ACP is much better than any of the other front end systems I've seen." - *Acorn User, August 1987.*

"I can recommend it to anyone who wants easy access to the Electron's functions." - *Electron User, August 1987.*

ACP's main features are:-

- \* Pull down windows operate throughout
- \* Users can create their own windows
- \* Simple to change MOS's configure options
- \* Easy entry to other languages
- \* Floating point calculator
- \* File manager
- \* Floating point calculator

### ADVANCED ELECTRON DFS E00

(14) /E+ABR/ £17.38 ex VAT £19.99 inc VAT  
An alternative to the DFS on rom for Plus 3 and ABR users. This optional alternative DFS is designed for use in Sideways RAM (ABR) and allows the user to operate a disc filing system &E00 when using the Plus 3 (in ADFS page would normally be &1D00). The DFS is simply loaded using the software supplied with the ABR from disc. (3.5" ADFS disc + manual)

### ADVANCED ELECTRON DFS

(05) /E/ £21.00 ex VAT £24.15 inc VAT  
Electron & Plus 3 users... gain BBC compatibility by adding the Advanced Electron DFS (1770 DFS) this is the same disc filing system supplied with the BBC B+. Now you can produce and access (compatible) BBC disc based software. We can also supply 5.25" disc drives to add to your Plus 3 (inc. 2nd. drive adapter). \*ACP has produced another superb ROM for the Electron". . . Electron User Feb '86 (supplied on 16K EPROM + DFS MANUAL)

### ADVANCED DISC INVESTIGATOR

(06) /M/B/E/C £25 ex VAT £28.75 inc VAT  
A very powerful Disc utility for standard & non-standard discs. Backup most protected discs, edit any type of non-standard disc, check & repair faulty tracks, create new disc formats, copy 40 track discs to 80 track discs, verify two non-standard discs. (\*ADI features an extremely comprehensive sector editor, and one of the finest I've seen". . . Tubelink on Prestel) (supplied on 16K EPROM + manual)

### ADVANCED 1770 DFS

3 versions ADM/C(11) - ADB(12) ADE(13) £30.00 ex VAT £34.50 inc VAT  
ACP have totally re-written the Acorn 1770 DFS, enhancing existing features & adding new ones. The result is a very fast and powerful disc filing system with the ability to operate in double density occupying both sides of a disc (640K). Automatic file relocation, improved file handling, 62 file catalogue and Sways RAM can be used as a fast RAM DISC. (16K EPROM + comprehensive manual)

### ADVANCED DISC TOOLKIT

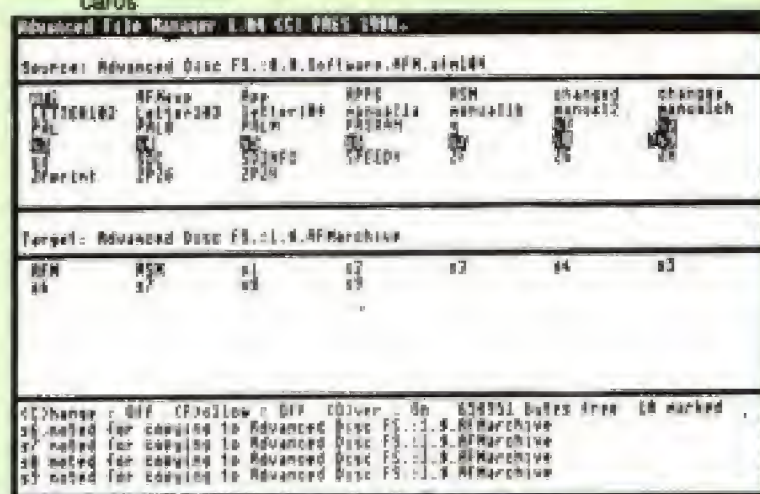
(01) /M/B/E/C £30 ex VAT £34.50 inc VAT  
Any Acorn user including Master, BBC B+, Electron, DFS, 1770 DFS, ADFS, 2nd & co-processors A.C.P.'s BEST SELLING product containing over 30 commands inc.: - powerful memory & disc editor, search memory/disc/basic, catalogue/unplug ROMs, load/run programs below page, automatic menu, file transfer (inc. locked cassette files), ADFS utils etc. etc ("it's superb". . . Database Pubs. - "A top-class toolkit - I have no hesitation in recommending it. . . Acorn User Nov. 85")

(16K EPROM & FULL MANUAL)

## PRES - ADVANCED FILE MANAGER

The ultimate 'front-end' for ADFS and DFS includes:

- Menu** - infinitely expandable
- Delete** - deletes any number of files
- Rename** - rename multiple files using wild-cards
- Copy** - extremely comprehensive file copier



Screen picture shows AFM in Copy mode on Master Turbo

AFM follows the PRES 'Master Plan' of upwards compatibility - it runs on Electron, BBC B, B+, B+128, Master 128 and Compact, with Second/Co-processors and Acorn-compatible versions of DFS & ADFS.

£25 ex VAT £28.75 inc VAT

### AFM has four distinct modes:

**MENU** - allows browsing through the files and directories on a disc. Files are started from a menu of up to 7 options chosen for a selected ROM. Loaders are provided for Basic, The Basic Editor, View, ViewSheet, ViewStore, ViewSpell, Edit, Wordwise (+) and InterWord. This list can be expanded infinitely using an Acorn-approved OSWORD call. . . full details and example in the manual.

**DELETE** - allows files to be marked and then deleted with one keystroke. **RENAME** - allows one or more files to be marked and then renamed using a wildcarded name, ie one which varies with each file renamed. Thus you could rename s1, s2 and s3 to be s1\_old, s2\_old, and s3\_old in one operation. . . and that's only the beginning! As well as using the whole of the original name you can also pick out individual characters to form part of the new name.

**COPY** - the strongest feature of AFM. It is a two stage copy routine. With both source and target directories shown on screen the files to be copied are marked. Once all the files have been marked copying is started and the computer can be left to get on with it!

Large files can be split across several disks, and recombined. As much as possible of the computer's memory is used for copying files, including unused parts of shadow screen memory, sideways ram banks (inc. AP7), ram cartridges (inc. ABR (32K) and AQR (256K)), tube memory (up to 61K), B+ paged ram (12K) and unused parts of the Slogger Master Ramboard (Electron).

Comprehensive error trapping and recovery is provided, so a copying run will rarely have to be aborted unfinished! And there's much, much more.

## DATABASE PUBLICATIONS: Electron software now available exclusively through PRES on 3.5" disc

Electron User 1988 Monthly Disc .....	£4.75	10 of the Best Vol 2 .....	£6.95
Fun School .....	£5.95	10 of the Best Vol 3 .....	£6.95
*Arcade Game Creator .....	£5.95	10 of the Best Vol 4 .....	£6.95
Nursery Rhymes .....	£6.95	Classic Card & Board Games Vol 1 ...	£7.95
10 of the Best Vol 1 .....	£6.95	Classic Card & Board Games Vol 2 ...	£7.95

5.25" disc versions available only  
\*Arcade Game Creator ..... £5.95  
\*Knitwear Designer ..... £9.95  
\*Back issues of Electron User required, see Database Publications own advertisement



# PRES

**NEW THE ADVANCED PLUS 3 MK II NEW**

The only fully compatible disc upgrade running Acorn's own filing system. The MK II is now supplied with 3.5" **DOUBLE SIDED** disc drive providing a storage capacity of 640K. A.P.3. MK II gives you:

1. A fully Acorn compatible 1770 interface (Cartridge)
2. 80 track 3.5" disc drive, double sided (640K)
3. Separate PSU
4. Acorn ADFS Advanced Disc Filing System
5. Welcome disc
6. Utilities
7. Full documentation
8. All the advantages of the original Plus 3 PLUS extra ROM socket.

**OUR TOP SELLING PRODUCT** **NEW IMPROVED**

Undoubtedly the most popular disc upgrade system for the Electron (Requires Plus 1)

Remember - 2nd drives (3.5 or 5.25) can be added and the AP3 drive can be used on a BBC or Master computer! Also most Electron disc-based software is supplied on 3.5" ADFS discs.

The only fully compatible disc upgrade running Acorn's own preferred filing system (supplied on: Plus 3, Master 128, Master Compact and now the Archimedes)

**\*\*\*EXTRA BONUS\*\*\***

3 games on disc - SNAPPER - DRAUGHTS - REVERSI

**COMPLETE PACKAGE ONLY**  
**£129 excl VAT; £148.35 inc VAT**

**ADVANCED PLUS 5**

A unique interface for those wanting the maximum expansion from just one slot in the PLUS 1. AP5 contains:- a User port for connecting peripherals such as a mouse, 1 MHz bus allowing Music 5000(E), prommers and various control devices to be added, Tube interface for connecting an Acorn 2nd. processor or even a Master Turbo board (through a 'Co-Pro Adaptor') - & TWO spare ROM sockets (1 high priority). All hardware connections are Acorn compatible thereby allowing many BBC products to be added (remember that some software modification may be necessary for the Electron). So although some expansion options may appear expensive on an Electron you do have upward compatibility.

**£50.00 Ex VAT; £68.24 inc VAT**

**ADVANCED PLUS 1** ... The plus 1 is the main expansion for the Electron. It provides the Centronics parallel printer, port, joystick interface and 2 cartridge slots into which go ROM cartridges including View, Viewsheet, Pascal, Logo and our own popular range of disc upgrades.

**£50.00 excl VAT; £57.50 inc VAT**

**ADVANCED PLUS 6** ... a fully buffered 6 ROM expansion module for the Electron user. AP6 is fitted inside the advanced Plus 1 or a modified Acorn Plus 1 (when used with the Acorn Plus 3, 5 ROM sockets are available). All sockets are designed to accept either ROM/EPROMS or RAM chips. A further feature is the optional AP7 upgrade.

"A marvellous piece of design ... don't hesitate, buy it!" - EU, May '88

**£33.00 excl VAT; £37.95 inc VAT**

**UPGRADE SERVICE** for the original Acorn Plus 1 to Advanced Plus 1 and AP6. This will provide all the benefits of AP6 and also includes the printer circuit modification for some modern printers. (AP6 can be fitted to original Plus 1 by users with soldering experience) for upgrade service add £7.00 + VAT to AP6 price ie

**£40.00 excl VAT; £46.00 inc VAT**

Incl. Mod, Fitting + Testing & Carriage. Send to:  
P.R.E.S. Service Department, PO Box 34, Shipley BD17 8DE

**ADVANCED ROM ADAPTER 2**

An Acorn approved cartridge containing a card with special 'zero' profile sockets that allow you to fit compatible 8k or 16k EPROMS/ROMS. The cartridge is fully enclosed providing complete protection for your ROMS. Simple to use - No switching - complies fully to the Acorn (sideways) Rom filing system.

"The best ROM cartridge is by far the ARA 2..." - A&B Dec 86

**£13.00 excl VAT; £14.95 inc VAT**

**ADVANCED BATTERY-BACKED RAM**

A standard Acorn approved cartridge but containing 32k (2 x 16k) of sideways RAM. The added bonus is the battery-backed feature that holds the RAM contents when the power is switched off! Different ROM images can be loaded into either bank from ROM images previously saved. The banks can also be locked to imitate ROM use. Now it is possible to have View & ViewSheet in one cartridge every time you switch on. Other uses include &E00 ADFS, printer buffer, ROM software development. The use of ABR is simplified by the newly written PRES software utilities which include:- SaveROM, LoadROM, Lock, Unlock, Printer Buffer, Zero and MakeROM a new utility to put your own software from disc or tape into ABR & use the ROM filing system. All software is supplied in ABR with a simple menu to transfer the utilities to your own media. No hardware switching - totally software controlled. Instructions for using supplied software and necessary information for users developing their own applications.

"It's a superb add-on and a must for all serious Electron users". ... Electron User

**£39.00 excl VAT; £44.85 incl VAT**

## PRES POLICY

1. To provide the best possible service & assistance to users.
2. Supply Acorn based or Acorn compatible products & to enable upward compatibility wherever possible.
3. Provide tested products with special attention to quality of design, components & production.
4. "Only to cash cheques & credit card receipts when we know we can supply the goods ordered."

## DISC INTERFACES (Plus One required)

**AP3 INTERFACE:** As supplied with AP3 package. A fully Acorn compatible disc interface that will accept any standard 5.25" or 3.5" 80T drive with PSU. It runs Acorn's ADFS (as supplied on Acorn Plus Three, Master 128, Master Compact and now the Archimedes) supplied with A.D.F.S. manual and welcome disc + Utilities and 3 bonus games (please specify 3.5" or 5.25" 80T format). Also provides a spare 16K rom socket.

**Price £52.00 ex VAT £59.80 inc VAT**

**AP4 INTERFACE:** A fully Acorn compatible disc interface that will accept any standard 5.25" or 3.5" drive with PSU. It runs the 1770 DFS (as fitted in the BBC 'B' and Master) keeps pace at &E00 - has utilities in rom and provides a spare 16K rom socket (DFS manual included).

**Price £60.83 ex VAT £69.95 inc VAT**

**AP34 INTERFACE:** Get the best of both filing systems. Now available from PRES the ultimate interface. Fitted with both Acorn approved filing systems. ... Acorn's current standard ADFS and Acorn 1770 DFS (which can be run at &E00) ADFS and DFS manuals supplied + ADFS welcome disc with utilities.

**Price £69.55 ex VAT £79.98 inc VAT**

**Please state 5.25" or 3.5"**

## ADVANCED PLUS 2 ROM

We feel this is one of the best, low cost, additions we have produced for the Electron & +1 user, especially for Plus 3, AP3 & ABR users.

Now with this easy to fit upgrade you can add:

1. Fix for Tape filing system in Hi-res screen modes.
  2. \*ROMS - to display all ROMs/ROM images present on the system.
  3. \*UNPLUG - disable ROM/RAM image.
  4. \*INSERT - enables or inserts a previously unplugged ROM.
  5. \*KILL - to totally disable the Plus 1.
  6. \*LOCK - to lock all sideways RAM banks found.
  7. \*LROMS - to lock all sideways RAM banks found.
  8. \*UNLOCK - to unlock all sideways RAM banks found.
  9. \*UROMS - to unlock all sideways RAM banks found.
  10. \*SAVEROM - saves a copy of a ROM image to the current filing system.
  11. \*LOADRUN - loads a ROM image from the current FS into a RAM bank.
  12. \*FORMAT - will format an ADFS disc for Plus 3 or AP3.
  13. \*VERIFY - reads and tests every sector on an ADFS disc.
  14. \*VFORM - formats and verifies an ADFS disc in one command.
  15. \*BUILD - creates a text file that can be used by \*EXEC (ie IBOOT).
  16. \*LIST - displays a numbered listing of a text file.
  17. \*TYPE - displays a file on screen with no line numbers.
  18. \*DUMP - to view a file's contents on screen.
  19. \*LANG - selects a default language to be booted on <CTRL-BREAK>
  20. \*HELP - provides a full 'help' list on all the ROM's commands
- \*\*STOP PRESS\*\***

21. \*AQRPAGE - selects the specified page in any AQR present. Now there is no need to search for your utilities disc every time you want to Format/Verify a disc, Build a IBoot file or Lock/unlock/Load a ROM image into ABR PLUS much more ... the ideal companion from the company that produces the Acorn Plus 1.

**£11.00 ex VAT; £12.65 inc VAT**

"The AP2 is the definitive Plus 1 Rom. ... I'm not sure what I'd do without it. ... Like all of PRES'S other products it's been well worth waiting for." EU July '88

## PRES ABR SOFTWARE

The new PRES ABR software now available separately containing: SaveROM, LoadROM, Lock, Unlock, Printer Buffer, Zero and MakeROM a new utility to put our own software from disc or tape into ABR & use the ROM filing system. Supplied on 3.5" ADFS or 5.25" DFS disc.

**3.5" £9.99 ex VAT; £11.49 inc VAT**

**5.25" £8.99 ex VAT; £10.34 inc VAT**

## ADVANCED PLUS 7

An internal battery-backed RAM upgrade for the Advanced Plus 6. TWO 16K pages of Sideways RAM, battery-backed and featuring full write protect facility. Just like ABR but fitted internally & vacating a cartridge slot. This product is compatible with all Acorn BBC/Master & Electron computers.

**£39.50 ex VAT; £45.42 inc VAT**

## \*\* USER PORT \*\*

A new low cost unit for those who just require a User port interface. Supplied in a standard size, Acorn approved cartridge, with the standard connector on top. Inside is a spare ROM socket which can also be configured for high priority use such as mouse software.

**£19.99 ex VAT; £22.95 inc VAT**



## ADFS VERSION 1.1

Suitable for existing Plus 3 or A.P.4 users. This new version has the software fixes for Zsysshelp, write protect disable & compaction. Also Winchester code has been replaced with the necessary driving software to handle AQR as a 256k RAM DISC. Please note - ADFS is Acorn's adopted standard filing system supplied on the Plus 3, Master 128, Master Compact & now the Archimedes. Supplied on 16k ROM with Welcome disc & utilities. Please state 3.5"/5.25" welcome disk.

£14.95 ex VAT; £17.19 inc VAT  
(ADFS manual supplied separately)

## ADFS E00

For Electron users with either Plus 3 or A.P. 4 and 32k of S/W RAM i.e. ABR. All the benefits of ADFS but without all the loss of RAM! Includes all the software 'fixes' as in version 1.1 as well as the AQR/RAM DISC code and an 'FX' call for managing the new & original ADFS. One of the most frequent questions we are asked; "How do I get back the memory lost on my Plus 3 system?" Answer: PRES ADFS & E00 regains 3.75k leaving page @ &E00 the same as Tape!

ADFS E00 supplied; 3.5" ADFS (manual available separately)

£14.95 ex VAT; £17.19 inc VAT

5.25" ADFS (manual avail. sep.) £14.00 ex VAT; £16.10 inc VAT

5.25" DFS (2 discs+ADFS manual) £19.00 ex VAT; £21.85 inc VAT  
(See Special Package Prices)

## AP4 MOD

This converts an AP3 to an AP34 (i.e. DFSE00) supplied as a two chip set, full documentation and fitting instructions.

£21.74 ex VAT, £25.00 inc. VAT

## ADVANCED GAMES COMPENDIUMS - ON DISC

With so many of our products providing more 'serious' add-ons for the Elk; we thought it was time to allow easy access to some of the favourite games ON DISC!

Three volumes of popular games, previously only available on tape, now 'instantly' loadable from menu on disc. Each volume contains EIGHT menu selectable games. Available on 3.5" ADFS or 5.25" ADFS.

Vol. I	Vol. II	Vol. III
Invaders	Felix and the Fruit	Danger UXB
Jet Power Jack	Monsters	Ghouls
Killer Gorilla	The Mine	Felix and the Evil Weevils
Stock Car	Rubble Trouble	Adventure
Bandits @ 3	Swag	Positron
Bumble Bee	Cyberton Mission	Swoop
Croaker	Moonraider	Chees
Felix in the Factory	Frenzy	Galactic Command
	Escape Moonbase Alpha	

3.5" £9.99 ex VAT each volume; £11.49 inc VAT

5.25" £8.99 ex VAT each volume; £10.34 inc VAT

A.D.F.S Guide Manual ..... £5.00

## NEW

### ELECTRON VERSION OF A.L.P.S.

(Adventure Language Programming System)

Well received on the BBC now available for Electron users on a 16k Rom and utilities disc either 3.5" ADFS or 5.25" DFS

£25.17 ex VAT £28.95 inc VAT

## NEW

## DISC DRIVES

### "NEW LOW PRICES"

Ex VAT

+VAT

Cumana 5.25" dbl/sided 40/80 track, switchable, inc. psu. .. £113.00 £129.95

Cumana 5.25" sing/sided 40 track, inc. psu. .... £112.17 £129.00

Cumana 3.5" dbl/sided 80 track, inc. psu. .... £112.17 £129.00

PRES Special 3.5" double sided 80 track, inc. psu. .. £78.00 £89.70

## DISCS

3.5" 10 in plastic library box - ideal for Plus 3 users ..... £19.95

5.25" 10 dble/sided dble/dens. .... £12.99

5.25" 10 sing/sided sing/dens. .... £8.99

5.25" Twin Gift Pack ..... £1.49

VIEW CARTRIDGE ... the Acornsoft word processor for the Electron and Plus 1. Inc. full documentation. .... £14.95

VIEWSHEET CARTRIDGE ... the Acornsoft spreadsheet for the Electron and Plus 1. Inc. full documentation. .... £14.95

VIEW & VIEWSHEET ... both products as above "special price" ..... £22.00

## MUSIC 5000

Turns your Electron into a computerised music production studio in which you can take a piece of music all the way from a sheet score, an idea of your own or one of the supplied examples, through entry, arrangement, replay and 'live' mix-down to a finished performance complete with custom instruments and studio effects.

Music 5000 is supplied as a powerful, stereo, digital, eight voice, 16 channel synthesiser with ROM software (containing the AMPLE language), disc software containing the example music files and full documentation.

The requirement for Electron Music 5000 is ... Electron, Plus 1, disc system (3.5 or 5.25 drive) running DFS or ADFS (preferably @ &E00) i.e. Acorn Plus 3, A.P.3 or A.P.4, 1 MHz bus (best option A.P.5.), and hi-fi amplifier or similar (Music 5000 has a standard 5-pin DIN audio connector for sound output). (Please state disc size & FS when ordering) £99.00 (ex. VAT) £113.85 (inc. VAT)

## SPECIAL PACKAGE PRICES

AP1 + AP3 .....	£165.00 ex VAT	£189.75 inc VAT
AP1 + AP6 .....	£77.00 ex VAT	£88.55 inc VAT
ABR + 3.5" ADFS E00 .....	£48.65 ex VAT	£55.95 inc VAT
ABR + 5.25" ADFS E00 .....	£48.95 ex VAT	£53.99 inc VAT
ABR + 5.25" DFS (ADFS E00) .....	£51.00 ex VAT	£58.65 inc VAT
AP5 + Music 5000 .....	£152.17 ex VAT	£175.00 inc VAT
AP7 + 3.5" ADFS E00 .....	£49.52 ex VAT	£56.95 inc VAT
AP7 + 5.25" ADFS E00 .....	£48.65 ex VAT	£55.95 inc VAT
AP7 + 5.25" DFS (ADFS E00) .....	£52.13 ex VAT	£59.95 inc VAT
AP4 + CS400 .....	£147.78 ex VAT	£169.95 inc VAT
AP1 + AP4 + CS400 .....	£189.00 ex VAT	£217.35 inc VAT

## ACCESSORIES

### ELECTRON POWER SWITCH

For those who are fed up with removing the power connector every time when resetting the computer or for those whose jack-plug connector has become unreliable by removing the power at random! This useful accessory provides a double-pole in-line switch with a new power jack-plug already attached; just connect to the existing lead, having removed the old jack-plug. £3.96 ex VAT; £4.55 inc VAT

### AP3 2nd DRIVE LEAD

Replaces existing drive cable with one containing an extra connector for adding a second drive configured as Drive 1.

£5.96 ex VAT; £6.85 inc VAT

### PLUS 3 2nd DRIVE ADAPTOR

Converts the fitting at the back of the original Acorn Plus 3, to take a standard disc drive connector when adding a second drive which has been configured to Drive 1.

£6.91 ex VAT; £7.95 inc VAT

### Panasonic KX-P1081 Printer Ribbon

£5.50 ex VAT; £6.32 inc VAT

ELECTRON ADVANCED USER GUIDE ... further reading and information for the Electron user. .... £3.95

### ADVENTURE GAMES ON DISC

5 adventures available on disc for Electron users. Each game is sold separately on disc: Ultimate Prize, Dreamtime, Pirates Peril, Taroda Scheme and Stranded.

3.25" ADFS £6.95 ex VAT per Disc; £7.99 inc VAT per Disc

### PHILIPS CM8833

Philips CM8833 14" Mod. Res. (600 x 285) RGB, CVBS, SKART + Audio inputs. Complete with BBC/Electron lead + Securicor delivery

£213 ex VAT; £244.95 inc VAT

## PRINTER

Printer ideal for Electron Plus 1, Panasonic KX-P1081 Graphic Epson Compatible NLQ ready to connect including cable, delivery and VAT

£155.65 ex VAT £179.00 inc VAT

### COMING SOON

ADVANCED BASIC EDITOR+ ... an exciting new product based on Acorn's original Basic Editor. It contains all the original features plus enhancements that make it one of the most powerful basic editors available. Supplied as a 32K ROM module or a cartridge with spare ROM socket.

1MHz BUS ... a new low cost unit for those who just require a 1 MHz Bus interface. Supplied in a standard size, Acorn approved cartridge, with the standard connector on top. Inside is a spare ROM socket for any application.

Please send order to: P.R.E.S. LTD., 6 Ava House, High Street, CHOBHAM, Surrey, England. GU24 8LZ. Tel: 0276 72046 (24 hr). Fax: 0276 51427

(Mail order only)

All our prices include

UK delivery & VAT

Subject to availability



(In event of any query - please include your tel. no.)

Name .....

Address .....

Postcode .....

Tel: .....

Credit Card No: .....

Product

Qty

@

Total

I enclose payment for £ .....

Exp date .....

(Ref E4)



**E**ACH year many hundreds, or even thousands, of pounds are spent by software companies in a constant war against the pirate and hacker. It is a never-ending battle of wits, with the program protector – some programmers specialise in protection methods – on one side and the pirate and hacker on the other.

At one time the protection methods used were quite simple, the technical knowledge of the average user being quite limited. But over the last few years the level of expertise has risen and even those still struggling with basics can find tools to do the hacking for them.

Many *Electron User* readers have asked how they can protect their own programs from being accessed by other users.

Unfortunately this is such a complex subject that I can only just scratch the surface and present the most basic of techniques.

What we'll look at is how we can prevent a simple Basic program from being listed on the screen, edited and modified. Our first task must be to disable the Break and Escape keys to prevent anyone stopping the program then listing it.

The Escape key is disabled with \*FX229,1 and Break can be programmed like a function key:

```
*KEY10 OLD|MRUN|M
```

If these commands are placed at the start of a program once it is running the Escape key will be ignored and the program will be automatically run when the Break key is pressed. What this doesn't stop is a Control+Break. After hitting these keys and typing OLD the program can be listed.

To prevent this happening the following command can replace the two previous ones: \*FX200,3. It disables the Escape key and when Break or Control+Break are pressed the whole of memory from &400 upwards is cleared, wiping out whatever was in memory, making it impossible to list the program.

In addition you can make the Electron crash by poking the value &4C – a machine code JMP instruction – into the first byte of the Break vector.

This is entered twice when the Break key is pressed and our poke will cause the micro to hang up. The only solution is to switch the power off.

This isn't the end of the story, as there is a very simple way for the pirate or hacker to gain access to your program or data. The methods discussed so far prevent you interrupting the program once it is running, but if you load it you can simply list it.

As long as the program isn't run it can be hacked into easily without specialist knowledge. Clearly additional, more sophisticated, protection techniques must be employed.

The next step is to insert special VDU codes into the program to prevent it from being listed. A couple of good ones are 12, which clears screen, and 21, which switches off all output.

Once these codes are hidden in REM state-

ments, if anyone tries to list the program the screen will be cleared and the micro will appear to play dead. The only problem left is how to put the codes into the listing.

The first stage is to add several REM statements to the Basic program you want to

protect, using a REM statement as follows:

```
100REM**
```

Now you can use a simple procedure to scan the program and replace the two asterisks with the codes 12 and 21. Add the fol-



# For your eyes only

**Julie Boswell reveals  
how to prevent your  
programs from being  
accessed with simple  
protection techniques**



following lines to the end of your program:

```
10000 DEF PROCprotect
10010 PX=PAGE+1
10020 REPEAT
10030 IF PX13=&F4 PX14=12:PX15=21
10040 PX=PX+PX12
10050 UNTIL ?PX=&FF
10060 ENDPROC
```

To protect it enter PROCprotect. Delete lines 10,000 to 10,060 and save the protected program. It should now be unlistable. Try it and see. I hope you saved a copy of the original program somewhere safe as you can't alter this one any longer!

One other trick we can perform is to wipe out the first line of a program once it has started. Adding the following procedure to the end will do the job:

```
11000 DEF PROCwipe
11010 PX=PAGE
11020 REPEAT
11030 ?PX=&FF
11040 PX=PX+1
11050 UNTIL ?PX=&00
11060 ENDPROC
```

You must include a REM statement at the start of your program and a call to PROCwipe. The first line is destroyed and once your program has finished you'll get a *Bad program* error message and it can't be listed.

You can combine all the techniques outlined so far. Add \*FX200,3 to clear memory then include the VDU codes in REMs and finally wipe out the program's first line.

You may be thinking that if anyone gets through that lot they deserve a medal, but it is easier than you might think. Armed with a simple memory editor the program can be loaded and the VDU codes overwritten with harmless spaces. It can then be listed.

What we have done so far will prevent the average user from accessing your programs, but it won't deter the hardened hacker or smart Alec. More sophisticated techniques are called for.

What we can do is to scramble the Basic listing so that it can't be recognised by the Electron as a Basic program. It then can't be listed or examined with a memory editor.

The following utility will load a Basic listing called PROGRAM, scramble it, then save the resulting code:

```
10 REM Scrambler
20 HIMEM=(TOP+600)AND &FF00
30 PX=HIMEM
40 file=OPENIN "PROGRAM"
50 REPEAT
60 byteX=BGET#file
70 byteX=byteX EOR &AA
80 ?PX=byteX
90 PX=PX+1
100 UNTIL EOF#file
110 CLOSE#file
120 OSCLI"SAVE PROGRAM "+STR$ "HIMEM" "+STR$ PX
```

It works by exclusively ORing each byte of the file with &AA (any value could have been chosen). Now if you try to load or chain it you'll simply get a *Bad program* error message.

What is required is a loader utility that will load the program, unscramble it and then run it. The following will perform this task quite nicely:

```
10 REM M/C Unscrambler
20 REM By R.A.Waddilove
30 REM (c) Electron User
40 osfind=&FFCE
50 osbget=&FFD7
60 osci=&FFF7
70 osbyte=&FFF4
80 store=&7D
90 channel=&72
100 FOR pass=0 TO 2 STEP 2
110 PX=&C00
120 C OPT pass
130
140 \Unscramble machine code
150 LDY #end-start
160 .loop
170 TYA
180 EOR start,Y
190 STA start,Y
200 DEY
210 BNE loop
220
230 .start
240 \Disable Break key
250 LDA #&4C
260 STA &2B7
270
280 \Disable Escape key
290 LDA #200
300 LDX #3
310 JSR osbyte
320
330 \Open file
340 LDA #240
350 LDX #name MOD 256
360 LDY #name DIV 256
370 JSR osfind
380
390 \Load file
400 TAY
410 LDA &18 : STA store+1
420 LDA #00 : STA store
430 .loop
440 JSR osbget \get byte
450 PHP
460 EOR #&AA
470 STY channel \save Y
480 LDY #0
490 STA (store),Y
500 INC store
510 BNE ok
520 INC store+1
530 .ok
540 LDY channel \get Y
550 PLP
560 BCC loop
570
580 \Close file
590 LDA #0
600 JSR osfind
610
620 \Run program
630 LDX #key MOD 256
640 LDY #key DIV 256
650 JSR osci
660 LDA #138
670 LDX #0
680 LDY #128
690 JMP osbyte
700
710 .name
720 EQU$ "PROGRAM"+CHR$13
730 .key
740 EQU$ "KEY0 OLD|RUN|M"+CHR$
13
750 .end
760 }
770 NEXT
780
790 REM Scramble machine code
800 YX=end-start
810 REPEAT
820 start?YX=start?YX EOR YX
830 YX=YX-1
840 UNTIL YX=0
850
860 REM Save Loader
870 OSCLI"SAVE LOADER COD "+STR$
$*end
```

A machine code loader program

```
10 REM Unscrambler
20 PX=PAGE+256
30 file=OPENIN "PROGRAM"
40 REPEAT
50 byteX=BGET#file
60 byteX=byteX EOR &AA
70 ?PX=byteX
80 PX=PX+1
90 UNTIL EOF#file
100 CLOSE#file
110 PAGE=PAGE+256
120 *KEY0 OLD|RUN|M
130 *FX138,0,128
```

This is a vast improvement over our previous methods, and combined with the other techniques will prevent access by all but the most determined hacker.

One flaw with this unscrambler is the fact that it is written in Basic. This reduces its effectiveness quite dramatically as you can simply load it, delete the last two lines and run it to unscramble the Basic program.

Then with a memory editor you can whip out the disabling VDU codes and you've now got access to the listing. The battle against pirate and hacker continues...

So far we have made our program unlistable and unrecognisable to Basic by scrambling it. What we need to do now is to make the loader unlistable too. We could scramble it, but we'd need a loader to load the loader. And this would still be listable.

A little machine code is called for. By rewriting the loader in assembly language

we can create a machine code loader program that can only be \*RUN. It can't be listed and Basic programmers won't be able to decipher it.

However, armed with a disassembler it could still be cracked by a machine code programmer. To raise an additional barrier the code itself can be scrambled so that it can't be disassembled.

The following program is a rewrite of the last using assembly language. When the code has been assembled it is totally scrambled apart from the first six instructions and then saved.

If you examine this loader using a disassembler all you will see are the first six instructions followed by garbage. To run your scrambled Basic program all you do is enter:

\*RUN LOADER

The machine code loads, unscrambles itself, disables the Break and Escape keys, alters the Break vector, loads the program, unscrambles it and then runs it. Although it may sound quite a long-winded process it all happens so quickly you won't notice it.

Don't leave the source code lying around as this will help a hacker to discover what your machine code loader is doing. Also vary the byte that the Basic program is exclusively ORed with.



Don't miss out on the mass of material that's appeared in *Electron User* over the past few months. Bring yourself up to date with this back issue bundle, packed with games, utilities, features and programming tutorials.

Here's what you'll find in the November 1988-April 1989 bundle:

**November 1988 issue:**

*Games:* Rally Driver, Bomber. *Utilities:* Elite Cheat, Disc and rom routines. *Features:* Using the Hybrid Music System, Adventure tips, Heyley interview. *Reviews:* Triple Deckers, Cheat it again Joe, Pipeline, Rebel Planet, In Search of Atahaulpa, DIY service manual.

**December 1988 issue:**

*Games:* Santa's Warehouse, Blow football, Senet board game. *Utilities:* Cut phone bills, Predict the pools. *Features:* Tape problems cured, Osfle routines explained, Floating point maths made easy. *Reviews:* Sam 4, Joe Blade, Frankenstein.

**January 1989 issue:**

*Games:* Sheep dog trials. *Utilities:* \*WIPE command for ADFS users, Retirement fund planner. *Features:* Game cheats, pokes and tips, Screen scroller, Elkview noticeboard. *Reviews:* Play it again Sam 3, By Fair Means or Foul, Golden Figurine, Pegasus disc interface.

**February 1989 issue:**

*Games:* Slippery Sam. *Utilities:* Supercharge your programs, Verfy tape programs. *Features:* Random access filing, Adventure hints, Reverse Polish tutor. *Reviews:* Pixel Perfect DTP, Preparing for breakdowns.

**March 1989 issue:**

*Games:* Taktiks, Trivia Test, Bomb Disposal, Sprog. *Utilities:* Search and Replace, Poetry. *Features:* Map of The Nine Dancers, Disc directories explored. *Reviews:* Repton Infinity, Question of Sport, Zenon, Last Ninja, Advanced File Manager.

**April 1989 issue:**

*Games:* Diamonds - a mind bending puzzle. *Utilities:* Pattern fill routine, automatic program saver, Home Finance Manager. *Features:* Input routines explained, disc drives revealed, palindromic numbers explored. *Reviews:* Sam 6, Exile, Orbital.

# electron

  
user

## BACK ISSUE BUNDLE

**Everything you ever wanted to know about your *Electron* but were afraid to ask is in these back issues of *Electron User***

Only £1.50  
each or  
**£7.99**  
for all six



**TO ORDER PLEASE USE THE FORM ON PAGE 51**



# MICRO MESSAGES

## Adventures with The Quill

*I AM a nine-year-old Electron user with a 3.5in ADFS disc system. I am rather ambitious and would like to create a good high quality text adventure. I have heard of adventure game creators and I hope you can recommend one to me, preferably on disc.*

*I've heard of Alpines's ALPS, Phoenix Software's Adventurescape, Incentive's Adventure Creator and Gilsoft's The Quill. I am looking for one which has lots of advanced facilities yet is reasonably easy to use. If you know of any such product could you please tell me where I could obtain a copy and what format it's in.*

*I would also like to know why Superior Software hasn't published many disc games, and as far as I am concerned all those which it has done are poor. Could you please tell me where I can obtain a*

*Logo rom (not in a cartridge) at a reasonable price? – Matthew Hammond, Chelmsford, Essex.*

● The Quill is the most widely used utility for creating Electron adventures, but we can't find anyone who can supply a copy. Can any readers or suppliers help?

The problem of disc software is all down to demand. Software will be released on disc if sufficient sales can be guaranteed to cover costs. However, it is not always possible to produce ADFS versions due to memory limitations.

Logo is only available for the Electron in a rom cartridge. We haven't used the BBC Micro version which comes on plain roms. You could try this, but it is risky as it may not be totally compatible.

*Replace program.*

*I have entered it, RUN it, but cannot use it. Perhaps you could ask Mr Geraghty to bear with those of us who are not well up in these matters and give us a hint at least on how to go about using it. – Daniel Brosyarn, County Kerry, Eire.*

● The accompanying article includes full instructions explaining how to use it. Here is a brief summary:

Run the program and enable the machine code with:

**CALL &COO**

Suppose you wanted to replace the old variable name *length* with the new name *width*. To do this you would enter:

**DELength=width**

Throughout the listing every occurrence of the variable *length* will be replaced by *width*.

## Infinity is impossible

*I RECEIVED Superior Software's Repton Infinity last Christmas and I now think one of the screens is impossible. It's the third in Repton 3 Take Two part one. I can't get to the middle of the screen.*

*If there was a key I'm sure it would be possible, but there isn't. I looked for it on the map and editor, but couldn't find it. In the manual there is a picture of this screen and the key is not on that either. Can anyone help? – D. Bibby, Wrexham, Clwyd.*

● Has anyone completed this screen, and if so, can you help with a few hints and tips?

## Prompting Trivia Test

*I FOUND the program Trivia Test in your March issue excellent. I entered the listing in less than an hour without making any mistakes. However, I have been unable to alter line 600 so that it prompts for a filename before loading different data files. What is the most straightforward method of doing this?*

*In reply to Steven Elkins' request for a screen dump for his Citizen 1200 printer – also in the March issue – can I suggest that he contacts C.J.E. Micros on 0903 213361 who supplied a tape and booklet with my Citizen printer. These contained hints, tips and utilities, including setting up procedures, VDU codes, DIP switch settings, a text dump,*

## Trouble with teletext

*WHILE reading March's Micro Messages I noticed the program to give teletext graphics on the Electron. I typed this in and entered RUN. I then typed:*

**PRINT T&C(n)**

*where n is a number between zero and 63 and got a Subscript error message. I didn't know what this meant so I entered:*

**PRINT CHR\$(n)**

*where n is a number between 160 and 190 and it worked. Why was this OK and the other not?*

*I played around with the program for a while and something strange happened. I typed PRINT and then copied the character produced by the code 177 and it produced a number which was different every time. This number was the same as that of the TIME variable. Could you tell me why this happened?*

*Also what is the best system for word processing, as I own an unexpanded Electron and wish to get the best from it.*

*Do you know what the command \*B. means? It prints BASIC on the screen. – Matthew Green, Halifax, West Yorkshire.*

● We aren't sure why the teletext program

didn't work for you, but suspect that it was due to a typing error. Please check your listing carefully.

The PRINT CHR\$(n) command is quite different and totally unrelated. It is a simple Basic command that prints a character on the screen. We can't reproduce the effect you describe when copying the character with an Ascii code of 177 and are stumped by your results.

You'll need a Plus 1 and printer for word processing, and of course, software. The vast majority of Electron users use View on rom cartridge as it is reasonably cheap and very powerful. A disc drive is extremely useful, but is more of a luxury than a necessity.

The \*B. command is used to enter the Basic language. You would normally do this when you have finished with View or Viewsheets.

## Reprise on Replace

*I HAVE been the proud owner of an Electron with a Plus 1 and Plus 3 for about three years and I am a regular reader of your excellent magazine.*

*However, I do have one complaint. Many of your contributors assume a level of expertise among your readers which is not always the case. For instance, in the March issue the article and program, Try ringing the changes, does not tell us how to use the*

Turn to Page 48 ►



#### ◀ From Page 47

graphics screen dump and a View printer driver.

I can recommend the 1200, which is a dot matrix printer capable of 120cps. It offers a wide variety of print styles and is reasonably priced at £159.

If any Electron owner would like to share ideas concerning their hobby, I can be contacted through PO Box 122, Taunton, Somerset. Alternatively my mailbox number on MicroLink is MAG40165. My set-up consists of a 64k Electron, Plus 1, Plus 3, Citizen 1200 printer and a Nightingale modem. — **Bob Standing, Taunton, Somerset.**

- You can make Trivia Test prompt for a data filename by adding these lines:

```
590 INPUT "Filename";dfn$
600 OSCLI "LOAD "+dfn$+" "+STR
$"HIMEM
```

## Dumping in colour

IN June 1986 I entered the screen dump from Electron User and I have been using it very successfully ever since. Recently I bought a Star colour printer and would very much like to dump my graphics in colour. However, I cannot locate any screen dump software that will do this.

Can the June 1986 UCode program be modified to identify and reproduce coloured graphics? If so, could you possibly publish an update? I for one, and I'm sure many others, would be most grateful.

Alternatively, can you please suggest a source of colour dumping software? — **D. Randle, Brooksby, Leics.**

- Sorry, we haven't heard of any colour dump software specifically for this printer and the Electron and the Ucode program can't be altered to produce colour.

## Search for compatibility

I WOULD appreciate your advice on upgrading my Electron to enable it to be used, among other things, for technical computations, word processing, spreadsheets and educational programs. At the same time it must be compatible with the BBC Micro using the ADFS to which I have access at work, and the Archimedes used by my daughter's school.

Although I have read various articles in your magazine (and numerous advertisements!) I am still somewhat confused by all the products apparently available.

As someone who has used computers at home and work, but have only a limited understanding of their internal operation, what I feel I need is a simple guide to recommended options and approximate costs which will hopefully meet my requirements. — **D. J. Mould, Alton, Hampshire.**

- What you need is a Pres AP3 disc inter-

face and 3.5in drive. This will give you compatibility with both the BBC Micro (with ADFS) and Archimedes. The Archimedes can read and write to Electron discs, but can format discs that the Electron can't read so make sure they are formatted on the Electron.

## Running the Gauntlets

CONSIDERING the quality of recent Electron games I am sure that Gauntlet I and II could be converted to the Electron with graphics almost as good as those of the Commodore 64.

I don't mean the Gauntlet by MicroPower in which you are a spaceship shooting aliens, but the one by US Gold which has four good guys — Merlyn, Questor, Thrór and Thyra — running around mazes shooting ghosts, trolls, Death and so on.

It's a brilliant game and I would love to see it released for my micro. — **Andy Duncan, Camberley, Surrey.**

- Gauntlet is quite a complex game, but we can't see why a slightly simpler version couldn't be written for the Electron.

All programs printed in this issue are exact reproductions of listings taken from running programs which have been thoroughly tested.

However, on the very rare occasions that mistakes may occur corrections will be published as a matter of urgency. Should you encounter error messages when you type in a program they will almost certainly be the result of your own typing mistakes.

Unfortunately we can no longer answer personal programming queries concerning these mistakes. Of course letters about suggested errors will be investigated without delay, but any replies found necessary will only appear in the mail pages.

## Put me in the picture!

I WONDER if any of your readers could help me? I recently bought a copy of Acornsoft's Picture Maker. However, the instructions booklet was missing from the box and the retailer where I bought it from was unable to find one for me.

Could any reader please be kind enough to let me have a copy of the instruction book? I am so frustrated that I'm unable to use my program and can't wait to draw with it. — **Rupert Plumridge, Marshfield, Wiltshire.**

## BBC Basic hits the pools

IN response to Mrs Blakeway's query in February's issue concerning the Pools Predictor listing from your December 1988 issue, the problem is not with the listing, but with BBC Basic.

It does not allow variable names which are also Basic keywords, hence the problem with the variable DRAW%. Because of this quirk, it is always best to use lower case variable names. — **Darren Douch, Rye, East Sussex.**

- Apart from the resident integer variables A% to Z% all the variables used are lower case. Unless listings are entered exactly as printed they are unlikely to work.

## Protecting listings

I HAVE noticed that most commercial software has protection to stop users from listing the program. How could I protect my Basic programs?

I would also like some good sound effects, for example, lift-off of a spaceship. — **Oliver Wright, St Ives, Cambridgeshire.**

- Program protection is a very complex subject and involves many advanced programming techniques. You'll find an article outlining some of the simpler methods on Page 20.

The easiest way for you to protect your program is to use the command \*FX200,2 in the first line of the listing. Enter and run this short listing to hear the sound of a spaceship blasting off into space:

```
10 REM Spaceship blast-off
20 ENVELOPE 1,1,1,1,1,5,5,5,126,0
   ,0,-126,126,126
30 FOR I=0 TO 250 STEP 5
40 SOUND 1,1,1,5
50 NEXT
```

Have any readers discovered any interesting sound effects?

## Bins full of energy

IN the February issue of Electron User Roland Waddilove reviewed the game Joe Blade 2. He asked what the dustbins were for.

At the bottom of the screen there is a bar with a line on it denoting your energy. Every time you touch a punk this line goes further left and if it ever gets to the end of the bar you lose a life.

However, if you collect five bins the line goes back to its original position, giving you extra energy.

I have managed to complete this game with a score in excess of 30,000 points. — **James Reed, Heald Green, Stockport.**



## Piling on the speed

*SUPERCARGER* from your February issue is a great little utility. I have been using it in conjunction with the Turbo Save utility from December 1987's *Electron User* and together they speed up playing and tape loading, using much less tape into the bargain.

You can print a hard copy using Control+B when prompted for the filename, but it uses a lot of paper, especially with fairly long programs, so I have added the following lines:

```
91 PRINT "Printout required (Y/N
)?"
92 IF INSTR("Yy",GET$) THEN 93 E
LSE 100
93 VDU2:*FX6
175 VDU3
```

VDU2 switches on the printer and \*FX6 enables automatic line feed, VDU3 switches off the printer.

Thanks for a great magazine. – Tony Bullock, Menorca, Spain.

## Running short of power

I HAVE contacted many *Electron* users regarding the replacement of my broken power adaptor, but regrettably they have not been able to assist. Can you help? – R.J. Eames, 97 Lon Hedydd, Llanfairpwll, Gwynedd, North Wales.

● If it's the computer end that's broken a power switch from Pres may be the solution. Otherwise a new one can be obtained from Software Bargains, 8A Regent Street, Chapel Allerton, Leeds LS7 4PE. Tel: 0532 687735.

Can any readers help Mr Eames? All Plus 3 owners should have two power supplies. The original one is redundant as a replacement was supplied with the Plus 3.

## Free tapes welcomed

I THINK your magazine is really good and would not buy any other *Electron* magazine. I have recently taken out a subscription with which I get a free tape. This is very useful because I find that I don't have enough time to type in the listings myself. – C. Sansbury, Aberdeen.

● What other *Electron* magazines are there?

## Vanishing 10 Liners

I AM a great fan of the 10 Liners page and when I read the contents page of your March 1989 issue I noticed that they were in, so I bought the magazine out of my weekly £1.50 pocket money.

When I got home I was very distressed to

*I HAVE been looking for a word processor which will allow me to produce a newsletter providing two columns on a single page without the need to cut and paste.*

*As many of your readers will be aware, View does not do this. However, I have worked out a method that will allow me to have two columns a page.*

*Set the ruler to the width of one column. As soon as the words spill over to the next*

*line delete the characters on the new line and enter the line number. For instance, if you have just overflowed from line 10, enter 10 in place of the overspilled characters, followed by Return.*

*When you have typed in the correct number of lines to make up one column, go back to the first line and continue your document by overwriting your line number.*

*When this line overflows, delete the new line with Function+8. Move the cursor to the end of the previous line and using Function +/, concatenate the two lines.*

*Use Function+9 to add the number of spaces required between the two columns. Continue in this manner until a complete page is finished. I know it is a little tedious, but becomes less cumbersome with practice. It is important not to reformat the new page. – David Martin, North Walsham, Norfolk.*

● The line numbers are unnecessary. Basically, the technique used is to type in the text on every other line until the bottom of the column is reached. Then go back and type on the blank lines. Finally join line two to line one, four to three, six to five and so on, also adding spaces in between the columns. The two screen dumps demonstrate how this is done.

```
FJI.....*.....*.....{
.. .....*.....*.....{
Multi column print
```

output from View is quite easy if you follow this simple guide:

First decide how many lines you want in the column. Then enter the text on every other screen line until you've got enough lines to fill the column.

Enter the first column of text on alternate lines

```
FJI.....*.....*.....{
.. .....*.....*.....{
Multi column print
output from View is
quite easy if you follow
this simple guide:
First decide how
many lines you want in
the column. Then enter
the text on every other
screen line until you've
got enough lines to
fill the column.
When this is done,
go back and fill in the
blank lines with the
text for column two.
```

\*\*\*\*\*

After filling in the blank lines with text for the second column, join pairs of lines together

When you have typed in the text for both columns, go back to the start and join line two to the end of line one, line four to the end of line three, line six to the end of line five and so on. Space them out as required.

find that the 10 Liners page was missing. Why was it not there? – Richardo Lobo-Morell, Farnborough.

● We are sorry to hear of your disappointment. The reason for the error was quite simple. Although the contents page is normally the final one to be written it is sometimes necessary to make last minute changes to the magazine – perhaps due to late adverts – after this has been completed.

This appears to be the case, but unfortunately, the contents were not changed to take the changes into account. To compensate for the omission we have included a double-page 10 Liners feature in both this and last month's issue.

## Pen pal plea from Holland

AS a reader of your magazine for three years I would like to congratulate you on producing such an excellent publication. I own an *Electron* with a Plus 1, Plus 3, Rombox Plus with View, Sheet, ADT and Pascal. The *Electron* is fitted with self-made 32k rom-ram cartridges. An input-output port and a speed-up board (up to 300 per cent speed increase).

Now I would like to contact *Electron* users in the UK to swap ideas, for example hardware projects, experiences and programs. – Wilfred De Wolf, Marijkestraat 8, 4744-AV Bosschenhoofd, The Netherlands.





# How's this for an incredible deal?



**Magazine +  
monthly tape**

Usual  
price **£50**

**OFFER PRICE**

**£19\***

(including post & packing)

*For details of the  
Cheat it Again  
compilations,  
please turn to  
Page 40*

Subscribe to *Electron User* for a year and we'll send you the monthly tape absolutely FREE! Plus you can buy any of the Cheat it Again Joe tapes for only 99p!

That's right, our tapes have proved so popular we've decided to make them available to EVERYONE who subscribes – totally free. And that adds up to massive saving of £31!

Just think, not only will you get your favourite magazine delivered to your door before it's on sale in the newsagents, you'll also get a free tape each month containing all the listings from that issue – plus the occasional extra.

And when you subscribe, you can buy any one of the three Cheat it Again, Joe compilations shown on Page 40 for just 99p.

*So, subscribe today for only £19, and as well as ensuring you get Electron User each month, with the free tape you'll save the wear and tear on your fingers, and get programs that work correctly – the first time!*

\* UK offer only

**Subscribe today, using the form opposite**



## ORDER FORM

All prices include postage, packing and VAT  
Overseas orders sent exclusively by Air Mail

Valid to May 31, 1989  
Please enter number required in box

Some Electron User disc products are now available from  
P.R.E.S. through their advertisement in this issue.  
All software on this form is available only on tape

**Annual subscription** (see opposite page)

Includes FREE monthly tape (UK only)

£p

	NEW	RENEWAL
UK £19	3001	3002
Europe (incl. Eire) £23	3003	3076
Overseas £38	3004	3077

Commence with \_\_\_\_\_ issue

Get either of these for only

**99p each**

when you subscribe.

(see page 20)

Cheat it again Joe 1 3076

Cheat it again Joe 2 3077

Cheat it again Joe 3 3146

**Back Issues**

(see page 4)

November 1988 to April 1989 bundle

£7.99 3300

Add £3 Europe &amp; Eire / £12 Overseas

November 1988	£1.50	3232
December 1988	£1.50	3233
January 1989	£1.50	3235
February 1989	£1.50	3235
March 1989	£1.50	3236
April 1989	£1.50	3237

Add 50p per issue Europe &amp; Eire / £2 Overseas

**Fun School 2**

(see page 13)

Under 6 years	£9.95	3087
6 to 8 years	£9.95	3088
Over 8 years	£9.95	3089

Add £2 per program for Europe &amp; Eire/£5 for Overseas

**Zenon**

(see page 20)

**NEW**

£4.95 3143

Add £2 per program for Europe &amp; Eire/£5 for Overseas

**Clogger**

(see page 20)

**NEW**

£4.95 3144

Add £2 per program for Europe &amp; Eire/£5 for Overseas

**Orbital**

(see page 20)

**NEW**

£4.95 3145

Add £2 per program for Europe &amp; Eire/£5 for Overseas

**DTP Yearbook**

(see page 52)

**NEW**

£p

£9.95 0505

Add £2 for Europe &amp; Eire/£5 Overseas

**Arcade Game Creator**

Includes full documentation

(see page 46)

£9.95 3096

Add £1 for Europe/Overseas

**Cheat it again Joe**

(see page 30)

Volume 1	£2.99	3094
Volume 2	£2.99	3095
Volume 3	£2.99	3142

Add £2 per program for Europe &amp; Eire/£5 for Overseas

**Educational Bundle**

ALL THREE Fun School 1 PLUS Nursery Rhymes

(see page 18)

£9.95 3084

Add £3 for Europe &amp; Eire / £7 Overseas

**Mini Office**

(see page 8)

£5.95 3062

Add £1 for Europe/Overseas

**10 of the Best Education programs**

(see page 40)

£5.95 3063

Add £1 for Europe/Overseas

**Magazine binder**

£3.95 3059

Add £3 for Europe &amp; Eire/£7 for Overseas

**Books**

(see page 32)

All three books £7.95 3061

Add £3 for Europe/Overseas

Readers in Europe (inc Eire) add £2. Overseas add £5 per  
item unless otherwise indicated

TOTAL

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Send to:

**Database Direct, FREEPOST,  
Ellesmere Port, South Wirral L65 3EB**

(No stamp needed if posted in UK) Please allow 28 days for delivery

Order at any time of the day or night

Telephone: 051-357 2961

Fax Orders:  
051-357 2613

Orders by Postel:  
Key '89, then 614568383

MicroLink/Telecom Gold  
72:MAG001

Don't forget to give your name, address and credit card number

Payment, please indicate method (✓)

☐ Access/Mastercard/Eurocard/Bardaycard/Visa

 Expiry  
Date

No.

☐ Cheque/Eurocheque made payable to Database Publications Ltd.

Name

Signed

Address

Post Code

Tel

EU5



# Upgrading to 16 bit?

Whether you're about to buy an Atari ST, an Amiga or a PC, we've got just the magazine for you.

Atari ST User, Amiga Computing and PCA are THE three top magazines dedicated to 16 bit micros. Written in the easy-to-read Database style, each magazine is the ideal companion for the micro it covers.



**£1.95**

The biggest and fastest growing magazine for users of the Atari ST.

It's packed with all the information you need to make the most of your ST, including a pull-out section which grows into a complete reference guide, interviews with top ST programmers and exclusive previews of the latest business and games software



**£1.95**

Britain's newest and brightest magazine for Amiga Users.

In each issue are reviews of all the latest software, ranging from games, art packages and business programs, to video titling systems, music creators and languages.

Learn about the Amiga's incredible sound and graphics capabilities, and how to write your own games, utilities and business software.



**£1.95**

The most up-to-date, fact-filled magazine devoted to the IBM PC, Amstrad PC and compatibles.

Each month it includes a free 5.25in disc, packed with the latest software, handy utilities, fast-action games, music programs and much, much more. There are thorough evaluations of all software and hardware, beginner's tutorials and language workshops, plus unbeatable special offers

**Save\***



An annual subscription to any of these magazines is £24.95. But as a reader of this magazine if you subscribe to them using the form below, we'll give you a £5 reduction.

So send off your subscription today. Ensure you get your copies delivered straight to your door – before they appear in the newsagents – and save money too!

## ORDER FORM

Please send me the next 12 issues of

☐ Atari ST User 9188 ☐ Amiga Computing 9532 ☐ PCA 5437

Please tick your selection and payment method \* UK only

☐ Cheque for £19.95 per subscription made payable to Database Publications

☐ Access/Visa account number.

\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|

Expiry date

Signed \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_|\_\_\_\_\_| Post Code \_\_\_\_\_

Daytime telephone number \_\_\_\_\_

Send to:

Database Direct, FREEPOST  
Ellesmere Port, South Wirral L65 3EB.

EUS

# EVERYTHING YOU NEED TO KNOW ABOUT DESKTOP PUBLISHING

**ONLY  
£9.95**

The Desktop Publishing Yearbook 1989 is an invaluable buyer's guide containing the

most detailed survey available of hardware, software and services in the electronic publishing field.

And there are clearly-written "how-to" articles for both the newcomer to Desktop Publishing and the experienced user.

Articles cover single-user and multi-user publishing systems, publishing

software, laser and other electronic printers, matrix printers, digitisers and scanners, computer typesetting, magazine and newspaper composition, documents and forms creation, bureau services, word processors, and many other key topics.

Whether you're a beginner or professional and would like to find out more about the exciting possibilities of DTP, then this book has all the information you need. Send for your copy today!



**TO ORDER YOUR COPY,  
PLEASE USE THE FORM ON  
PAGE 51**



## The pan-galactic cocktail bar

**Mike Cook shows how the Electron can help make some interesting and refreshing drinks**

**C**OCKTAILS are always popular at any time of year, so here is a program to help you create new and exciting drinks. Well, to be perfectly honest, some of the creations sound awful, but then, you never know until you try.

In the world of the cocktail bar, the rule is that almost anything goes, so this program is not terribly reticent about what it mixes.

Every cocktail must have its own unique name, so PROC\_Name designs one on a modified random basis. The process is open-ended so it can generate extremely long names on occasions. However, they should all be pronounceable – at least before trying the drink. And endless party fun can be had attempting to say the name after having imbibed.

The program classifies drinks according to type, for example spirits, liqueurs, fortified wines and soft drinks. The recipe for the cocktail is generated by choosing a random number of items – maybe zero – from each category.

Some drinks should never be mixed and these are separated into groups in the spirit and liqueur sections. The program will only

match group A and B spirits and liqueurs, never drinks from the same group. Basically group A spirits are grain-based and group B spirits grape-based. Similarly group A liqueurs are generally fruit-based with group B being herb-based.

The data statements defining the available ingredients can be modified to remove anything you disapprove of, or to add your own particular favourites. All sections end with a null string which tells the program that the end has been reached. Therefore all you need to do is add or remove items from the data statements in the appropriate section.

That's enough theory, happy mixing.



**WARNING:** It is an offense, under the 1876 Home Compu(hic)ter Act, to operate a compu(hic)ter while under the influensh of the prog...

```
10 REM The Pan Galactic
20 REM Cocktail Bar
30 REM By Mike Cook
40 REM (c) Electron User
50 MODE7:you$="aeiou"
60 con$="bcdfghjklmnpqrstvwxyz"
..
70 DIM drink$(7,50),max%(7)
80 FOR AX=0 TO 7:MX=0:REPEAT
90 MX=MX+1:READ drink$(AX,MX)
100 UNTIL drink$(AX,MX)=""
110 max%(AX)=MX-1:NEXT
120 drunk=FALSE:REPEAT AX=0(=
TIME)
```

### How to make a Tirebehu

2 Measures of Kirsh  
2 Measures of Madeira  
2 Measures of Pineapple Juice  
1 Measure of Lemon Juice

and some raisins  
and some ice cubes  
and some fresh pineapple cubes

```
130 CLS:PRINT"The Pan Galactic
Cocktail Bar"
140 PRINT"By Mike Cook"
150 PRINT""How to make a ";
160 PROC_Name:PRINT
170 IF AND(2)>1 PROC_ING(1):PRO
C_ING(2) ELSE PROC_ING(0):PROC_IN
G(3)
180 FOR AX=4 TO 6:PROC_ING(AX)
190 NEXT:PRINT:PROC_ING(7)
200 PRINTTAB(0,22)"Press P to p
rint"
210 PRINTTAB(0,23)"Press space
for another Drink"
220 REPEAT AS=GET$:UNTIL INSTR(
"Pp",AS)>0
230 IF AS="" " ELSE PROC_Print
240 UNTIL drunk
250 DEF PROC_ING(CX):LDX=0
260 TX=0:IF TX=0 ENDPROC
270 IF CX=7 PRINT"and some
";:G
OTO 300
280 PRINT TAB(4);TX;" Measure";
290 IF TX>1 PRINT"s of "; ELSE
PRINT" of ";
300 REPEAT DX=0:UNTIL DX=LDX:PRINT drink$(
CX,DX)
```

### How to make a Onagozadoke

1 Measure of Kirsh  
1 Measure of Sloe Gin  
1 Measure of Sweet Sherry  
1 Measure of Apricot Juice  
2 Measures of Pepsi

and some apple slices

```
320 IF RND(100)<10 LDX=0X:GOTO
260
330 IF CX=7 AND RND(100)<10
LDX
=0X:GOTO 260
340 ENDPROC
350 DEF PROC_Print:FOR YX=0 TO
19
360 LS="":FOR XX=0 TO 39:VDU31X
XX
370 AX=135:!&70=USR(&FFF4)
380 LS=LS+CHR$(71):NEXT:*FX3,10
390 PRINT LS:*FX3,4
```

Turn to Page 54 ▶



# ◀ From Page 53

```

400 NEXT:ENDPROC
410 DEF PROC_Name:RX=RND(21)
420 VDU ASCMID$(con$,RX)-820
430 IF RX=12 v$="u":VDU ASCv$
440 IF RX=15 IF RND(5)=1 VDU
AS
C"h"
450 REPEAT REPEAT v$=FNv(v$)
460 VDU ASCv$:UNTIL RND(15)>1
470 RX=RND(21):VDU ASCMID$(con$,
RX)

```

## How to make a Pequaguaqua

1 Measure of Schnapps  
2 Measures of Sloe Gin  
3 Measures of White Wine  
3 Measures of Pear Juice  
and some apple slices

```

480 IF RND(15)=1 VDU ASCMID$(co
n$,RX)
490 IF RX=12 v$="u":VDU ASCv$
500 IF RX=1 IF RND(20)=1 VDU
AS
C"b"
510 IF RX=2 IF RND(2)=1 VDU
ASC
"k"
520 IF RX=15 IF RND(9)=1 VDU
AS
C"h"
530 IF RX<>12 IF RND(15)=1 VDU
ASC"r"
540 UNTIL RND(5)>3

```

```

550 IF RND(9)<5 VDU ASCFNv(v$):
IF RND(15)=1 VDU ASC"r"
560 PRINT:ENDPROC
570 DEF FNv(x$):LOCAL VX,v$:REP
EAT
580 VX=RND(5):v$=MID$(vow$,VX,1
)
590 UNTIL v$<>x$:=v$
600 REM Spirits group A
610 DATA Gin,Whisky,Vodka,Kirsh
,Saki
620 DATA White Rum,Tequila,Schn
apps,""
630 REM Spirits group B
640 DATA Brandy,Dark rum,White
rum
650 DATA Armagnac,""
660 REM Liqueurs group A
670 DATA Apricot brandy,Peach b
randy
680 DATA Advocaat,Abricotine
690 DATA Blackberry Liqueur,Cas
sis
700 DATA Moka,Cherry Brandy,Coi
ntreau
710 DATA Creme d'Ananas,Creme d
e Cassis,Creme de Fraise
720 DATA Creme de Mandarin,Crem
e de Noyau,Curacao,Drambuie
730 DATA Framboise,Glavya,Grand
Marnier,Maraschino
740 DATA Van der Hum,""
750 REM Liqueurs group B
760 DATA Sweet vermouth,Dry ver
mouth,Strega,Sloe gin
770 DATA Millefiori,Creme de Me
nthe,Yellow Chartreuse
780 DATA Green Chartreuse,Campa
ri
790 DATA Dubonnet,""
800 REM Wines & Fortified
Wines

```

```

810 DATA White wine,Red wine,Ro
se wine,Cider,Port,Sweet sherry
820 DATA Dry sherry,Medium sher
ry,Madeira
830 DATA ""
840 REM Soft drinks
850 DATA Lemon juice,Apple juic
e,Pineapple juice, Tomato juice,Ap
ricot juice

```

## How to make a Kemeju

3 Measures of Whisky  
1 Measure of Sweet Vermouth  
3 Measures of Red Wine  
1 Measure of Apricot Juice  
1 Measure of Pepsi

and some fresh pineapple cubes  
and some lime peel  
and some dried apricots

```

860 DATA Orange juice,Mixed fru
it juice,Lime juice,Pear juice
870 DATA ""
880 REM Fizzy drinks
890 DATA Coke,Pepsi,7 Up,Lemona
de,Bitter Lemon,Tonic water
900 DATA Ginger ale,Soda water,
""
910 REM Floaters
920 DATA orange peel,ice cubes,
cloves,lemon peel,lime peel
930 DATA cherries,crushed ice,a
pple slices,raisins,dried apricot
s
940 DATA dried peaches,fresh pi
neapple cubes,orange slices
950 DATA ""

```

TWO WAYS TO ENSURE  
YOU GET

# electron user

EVERY MONTH

1. Complete and mail subscription form on Page 51
2. Hand this form to your newsagent.

Please reserve me a copy of Electron User magazine every month until further notice.

- ☐ I will collect  
☐ I would like it delivered to my home.

Name \_\_\_\_\_

Address \_\_\_\_\_

Note to newsagent: Electron User should be obtainable from your local wholesaler, or contact Circulation Manager on 0424 430422

## ADVERTISERS INDEX

Impact Posters.....	22, 23, 55
Kosmos.....	38
N Fotios.....	38
PMS.....	36
PRES .....	41, 42, 43
Slogger .....	26, 27
Software Bargains .....	7
Superior Software.....	2, OBC
Towerhill.....	34, 35
Voltmace.....	36







# PLAY IT AGAIN SAM



## PLAY IT AGAIN SAM 8 for the BBC Micro and Acorn Electron

One of the greatest sporting simulations ever produced for the home computer has been combined with three of Superior Software's best-loved games. The result is an action-packed, top quality four-game compilation. You can't afford to miss it!

BBC Micro Cassette ..... £9.95      Acorn Electron Cassette ..... £9.95  
BBC Micro 5 1/4" Disc ..... £11.95      BBC Master Compact 3 1/2" Disc ..... £14.95

(Compatible with the BBC B, B+ and Master Series computers)

Please make cheques payable to "Superior Software Ltd".

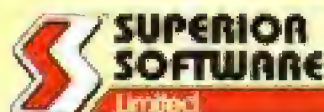
(The screen pictures show the BBC Micro versions of the games.)

## HAVE YOU GOT THE COMPLETE COLLECTION?

All these previous PLAY IT AGAIN SAM four-game compilations are still available from your local Dealer or direct by mail order from Superior Software.

PLAY IT AGAIN SAM 1 - Croquet, Thru, Snake's Run, Revenge  
PLAY IT AGAIN SAM 2 - Repton 3, Crazy Rider, Galaxforce, Codename: Droid  
PLAY IT AGAIN SAM 3 - Commando, Palace of Magic, Killer Gorilla, Killer Gorilla 2  
PLAY IT AGAIN SAM 4 - Frank, Spellbinder, Cosmic Camouflage, Grand Prix Construction Set  
(BBC Micro only), Guardian (Electron only)  
PLAY IT AGAIN SAM 5 - Imagin, Elter, Bug Blaster, Fortress (BBC Micro only), Moonrider (Electron only)  
PLAY IT AGAIN SAM 6 - Galaxforce 2, Hunchback, Hopper, The Sentinel (BBC Micro only),  
Video 1 Revenge (Electron only)  
PLAY IT AGAIN SAM 7 - Fireball, Borecylinder, Snapper, Ghouls

Prices are the same as for Play It Again Sam 8.



ACORNSOFT

(Acornsoft is a registered trademark of Acorn Computers Ltd. Superior Software Ltd is a registered user.)  
Dept 8PS3, Regent House, Skinner Lane, Leeds LS7 1AX. Telephone: (0532) 459453

Available from  
**WHSMITH**  
and all major dealers



24 HOUR TELEPHONE  
ANSWERING SERVICE FOR ORDERS

## OUR GUARANTEE

- All mail orders are despatched within 24 hours by first-class post
- Postage and packing is free
- Faulty cassettes and discs will be replaced immediately (This does not affect your statutory rights)